Gonorrhœa and Urethritis.

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GONORRHŒA

AND

URETHRITIS.

BY

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TO

HUNTER McGUIRE, M.D., LL.D.,

LATE PRESIDENT OF THE SOUTHERN SURGICAL AND GYNÆCOLOGICAL ASSOCIATION, PRESIDENT OF THE AMERICAN MEDICAL ASSOCIATION,

WHOSE BRILLIANT RECORD AS A SURGEON AND MEDICAL DIRECTOR IN THE CONFEDERATE ARMY HAS BEEN EQUALED ONLY BY THE ENVIABLE REPUTATION HE HAS ACQUIRED IN THE NORTH IN LATER AND MORE PEACEFUL YEARS,

THIS VOLUME IS RESPECTFULLY DEDICATED,

AS A TRIBUTE OF FRIENDSHIP AND ESTEEM, AND IN MEMORY OF PLEASANT HOURS OF SCIENTIFIC DISCUSSION AND SOCIAL INTERCOURSE,

BY

THE AUTHOR.

PREFACE.

In this little work the author has taken the liberty of reiterating the views upon the evolution of gonorrhœa which were originally published in an essay upon the "Evolution of the Local Venereal Diseases," several years ago. Aside from this indulgence in more or less speculative theorizing, the work will, it is hoped, be found to be distinctively practical.

URETHRITIS.

CHAPTER I.

URETHRITIS—ORIGIN AND GENERAL CONSIDERATIONS.

Urethritis is the most frequent affection which we are called upon to treat in genito-urinary practice, and it is more often contracted during sexual intercourse than any of the various forms of venereal disease. It has been figuratively described as the most venereal of this class of diseases, for the reason that it is by comparison very exceptionally contracted in any other way than by impure or excessive connection.

The most common term for urethritis is *gonorrhœa*, but this is a misnomer, for two reasons: (1) It implies a discharge or morbid flow of semen; and (2) it implies a disease of an unvarying type of specificity. The term *blennorrhagia* or *blennorrhœa* has also been applied to it, but is equally objectionable, inasmuch as it signifies a flow of mucus, and is not distinctive of any particular disease of a special portion of the body. The vulgar appellation of *clap* is hardly sufficiently dignified for scientific nomenclature, to say nothing of other objections to its use. The generic

term *urethritis* is accurate as applied to the affection in the male, inasmuch as it not only implies an inflammation of the urethral mucous membrane, but is sufficiently comprehensive to embrace all the varying forms of the disease, whatever their origin. It is necessary to use the term *gonorrhœa* from time to time in the discussion of the subject, in deference to common usage and for the sake of lucidity.

Urethritis is a very ancient as well as a very prevalent disease. It has been claimed that gonorrhœa was described in the writings of a celebrated Emperor of China fully 5,000 years ago. It was known among the ancient Greeks and Romans. It was certainly quite a familiar affection in the time of the patriarch Moses, and from all historical accounts his people were peculiarly subject to it, although it must be confessed that the Jew of the present day is less frequently affected by venereal diseases than almost any other race; this tends to show that, whatever heretical exceptions may be taken to the doctrines of the ancient patriarch, we are perforce compelled to acknowledge that he was certainly an excellent physician, and, moreover, an excellent judge of human nature.

The principles of sanitation laid down to the Hebrews in the 15th chapter of Leviticus, refer in all probability to this disease. I may say in this connection, that this particular chapter of the Bible is a most comprehensive and intelligent treatise upon gonorrhœa. It is evident, however, that the writer

confounded gleet, prostatorrhœa, and their congeners, with spermatorrhœa. From observation of cases of infection due to gleet he inferred that an "issue" of semen was infectious. It is evident also that he believed the menstrual secretion to be highly infectious. The period of purification observed by the Hebrew women has, then, a medical rather than a theological basis. The ancient law-maker, however, realized the necessity of investing personal hygiene with a religious significance in order to obtain its practical observance.

"Gonorrhœa" consists of a peculiar type of inflammation affecting the urethra of the male or genito-urinary tract of the female, and was formerly supposed to be invariably due to contagion by uncleanly intercourse; from this fact it was believed to be under all circumstances a specific disease, as is indicated by its name. We know nowadays that such inflammations are by no means necessarily specific, but may arise from a variety of causes; indeed, we are positive that it is dangerous in a large number of instances to apply the term *specific* to a case of urethral or vaginal inflammation, and that if we pronounce, in a routine way, every case of urethritis or vaginitis which comes under our care, "gonorrhœa," we are apt to involve ourselves in an endless amount of trouble. A great deal of injustice has been done through mistaken diagnoses of gonorrhœa. There is hardly a physician who has an opportunity to observe many cases of

genito-urinary disease who has not met with numerous instances of married men affected with urethral discharge undoubtedly contracted from their wives. If the surgeon incautiously and inconsiderately tells these individuals that they have gonorrhœa, much uncalled-for and unjustifiable trouble may result. The fact that any discharge in the female, whether physiological or pathological, may under favorable circumstances induce urethritis, should lead us to be extremely cautious in the matter of diagnosis.

The sources of error in the diagnosis of the origin of urethritis are so numerous that I believe it best to accept the proposition that, as a rule, it is never safe to pronounce a case of urethritis to be of specific origin unless it can be traced directly to contagion by intercourse with a woman suffering from virulent vaginitis or who has a history of a more or less recent attack of gonorrhœa. It is, of course, safe to pass a decided opinion regarding the character of a virulent urethritis in the case of an individual who acknowledges its questionable origin, or of a virulent vaginitis in a prostitute. It is always well to ascertain what the patient considers to have been the source of his difficulty, before giving the affection a name. It is very embarrassing to pronounce a urethritis a gonorrhœa or clap immediately upon inspection, and then have the patient assure you that he has had nothing whatever to do with anyone but his wife; for, even if you have the opportunity of examining her and find

her apparently free from disease, there will always remain a lingering suspicion in his mind regarding the chastity of one who is perhaps perfectly innocent. I had a case recently in which the patient contracted a virulent urethritis, followed by gonorrhœal rheumatism, from a woman who, upon examination, proved to be healthier than the majority of women, and who did not have even a uterine trouble to account for the difficulty. I will state that the patient in this case is a man 40 years of age, who never had urethral trouble before, but who is an inordinate eater and high-liver generally, and is extremely lithæmic, having suffered from irritability of the bladder for several years, due in all probability to a highly concentrated state of the urine. It may be asserted that the germs of gonorrhœa were left with this woman and subsequently infected my patient without affecting her; but as she is extremely cleanly and takes prophylactic injections of a moderately strong solution of carbolic acid after intercourse, for fear of pregnancy, I do not believe that such was the case; indeed, all of the circumstances tend to refute such a supposition.

According to the views of its origin which appear most satisfactory to me, the disease must of necessity have existed at a very early period in the history of the human species — not, perhaps, when mankind existed in a primitive nomadic state, but after the race began to develop into settled communities of some considerable size, with their attendant

physical deterioration, lack of hygiene, and corrupt morals. Fornication alone, however excessive, probably could not produce the disease in the savage in his natural condition. *Pari passu* with the advance of civilization has been the march of the venereal diseases. The more thickly settled and highly civilized the community, the more corrupt its morals and the more prevalent do the local venereal diseases become.* I believe that urethritis is developed in strict conformity with the same evolutionary laws of progression and differentiation that have characterized the development and differentiation of the human species. Just as soon as local diseases of an inflammatory character appeared in the sexual organs of men and women, the principal circumstances of environment necessary to the development of venereal diseases, and particularly gonorrhœa, had been acquired. The intervention of filth and the bacteria of decomposition constituted the only remaining elements necessary to the spontaneous development of the poison of urethritis and vaginitis. Prostitution or its equivalent, unbridled license, was probably essential to the peculiar change in the products of uterine and vaginal discharges which resulted in what is to-day held by many to be a specific poison. It is not claimed that

* Mr. Milton advances most learned and specious arguments to prove the modern origin of gonorrhœa. Nothing, however, can in my opinion controvert the testimony of the biblical record to which I have alluded.

prostitution alone is capable of originating the disease, for, as will be seen later on, it is probable that the high-toned prostitute of cleanly habits seldom originates it. When it occurs in a woman of this character the contagium has usually been brought to her. In the prostitute of less affluent circumstances, however, an entirely different condition of affairs exists, due to the intervention of filth, constitutional disease, privations of various kinds, and the lowest grade of intemperance.

In addition to the elements of filth, uterine disease, and the bacteria of decomposition, it is possible that there exists in certain individuals at certain times a peculiarly acrid state of the secretions; idiosyncrasy therefore may have much to do with the origin of gonorrhœa. In addition to this fact, there is, as is well known, a great difference in the susceptibility of the mucous membranes in different individuals. This is demonstrated conclusively by the varying effects of "cold"-taking upon the naso-pharynx. The differing degrees of susceptibility to the action of the iodide of potassium upon the mucous membranes are familiar to every practical physician. The genito-urinary surgeon has impressed upon him, as a matter of every-day experience, the varying susceptibility of the urethral mucous membrane, by the different degrees of reaction obtained from astringent injections. Many persons will tolerate injections of a strength which in others would excite violent inflammation;

the extreme irritation produced in some patients by very mild injections is a matter of considerable annoyance to the surgeon. To carry the matter of idiosyncrasy a little further, it is probable that many individuals are absolutely insusceptible to the virus of urethritis. Such patients will play the *roué* for the better part of their lives without ever experiencing an attack of gonorrhœa; while others—who perhaps consort with the same women—are continually afflicted with it. Acclimation, so to speak, has much to do with the insusceptibility of some individuals. We will suppose, for example, that a woman acquires after marriage a slight endometritis of a non-specific character; her husband, having regular intercourse with her, is not affected by the secretion of the uterine inflammation, although as the latter progresses the secretion eventually becomes very acrid. Another individual having intercourse with this woman may contract an apparently virulent urethritis. Cases of this kind have often come under my own observation. The acridity of the secretions of mucous inflammations in certain instances is well illustrated by the erosion (so-called ulceration) of the *os uteri* in severe cases of endometritis. It is shown in the excoriation of the lip resulting from ozæna and nasal catarrh in strumous children.

It is a matter of common observation that the virgin urethra is most susceptible to urethritis. It is very rare, indeed, that a patient does not acknowledge

that his first attack was more severe than any of perhaps a large number of subsequent attacks. After a time the average man becomes case-hardened and is much less likely to have urethritis of a virulent type. He is, to be sure, likely to have frequent attacks of so-called bastard clap, dependent upon a damaged condition of the canal, resulting from his first gonorrhœa, but it is rather exceptional that he experiences an attack of anything like the virulency of the one which initiated him into his venereal experience. There is something quite remarkable in the manner in which some cases of apparently virulent urethritis are contracted. A man, previously healthy and who has intercourse regularly with his wife, indulges in illicit intercourse; in a few days pronounced urethritis develops and runs the usual course, or perhaps results in all the possible complications. On examining the person from whom the disease was contracted, we find no indications of gonorrhœa—leucorrhœa, however, being present in the majority of instances. Now, if the woman be a prostitute, it is possible that the germs have been left with her in an adventure just previous to that with the unlucky married man, and that she has escaped infection on account of her extreme cleanliness or the toughness of her vaginal mucous membrane. If, however, she is not a professional prostitute, this is not so likely, and if she has leucorrhœa she could scarcely escape infection herself. Is it not rather more probable that through

chemical changes in the secretions from her uterus and vagina a poison has developed, which is particularly obnoxious to the urethral mucous membrane of the affected individual? Is it not possible, moreover, that a peculiar soil, *i.e.* a peculiar local susceptibility, is sometimes necessary to the development of urethritis; and, moreover, that this susceptibility may be absent at one time and present at another, as is true of constitutional diseases of an infectious character? Certain it is that some men fornicate almost all their lives without contracting the disease, while others are suffering from it perpetually. A number of men may successively copulate with the same woman, with resulting urethritis in only a small percentage of the number, and a varying degree of severity in those attacked.

It is probable that excessive indulgence in intercourse, or excessive excitement during the act, bears as important a relation to the origin of urethritis as does contagion. In the hypothetical case of the married man, to whom allusion has been made, it is probable that in his illicit indulgence the novelty of the situation, in combination with a desire to acquit himself creditably in his venereal exploit, impels him to over-indulgence. Add to this element the existence of filth, irritating uterine discharges, and a sensitive urethra, and a urethritis might quite reasonably be expected. Basing his views upon statistical investigation, Fournier is inclined to a somewhat similar opinion.

An interesting case bearing upon the relation of sexual excitement and individual predisposition to the causation of gonorrhœa came under my observation some time ago:

A young man of 18 passed the night with a young woman whose virtue he vainly tried to overcome; on the following day he noticed some smarting on urination. In the evening of this day he copulated with a woman who had favored several of his friends at frequent intervals for some time; this act of copulation was the first in the lad's experience. For the twenty-four hours preceding intercourse he had drunk considerable wine. On the third day after exposure, urethritis developed and ran a most virulent course, with all the accessories of severe chordee, epididymitis, and cystitis. The case proved very obstinate, lasting over a year. On examining the woman from whom the disease was contracted, she proved to be healthy, aside from a slight leucorrhœa. The young man's friends still continued to visit the cause of his woes, but failed to contract the disease. In this case, prolonged and ungratified desire caused an irritable state of the urethral mucous membrane, which favored inflammation; intercourse and the contact of irritating secretions did the rest.

It is a striking fact, as bearing upon the origin of urethritis, that specific vaginitis is not frequently seen in the female. In nearly every case in which there is an opportunity of examining women from whom

urethritis has been contracted they will be found to have neither history nor evidences of acute vaginitis, but will almost invariably be found to have uterine disease. Regarding this point Diday states that "from the very fact of a woman having a discharge she is liable to give a discharge to a man."

It would seem that, in view of the fact that disease analogous to urethritis may arise *de novo*, the theory of its spontaneous origin is logical enough.

The resemblance of Egyptian ophthalmia, purulent ophthalmia (whether epidemic or occurring in isolated instances), and ophthalmia neonatorum to virulent urethritis is very suggestive as bearing out the evolutionary origin of its *materies morbi.* Those who are familiar with the history of these diseases are aware that similar conditions may develop *de novo* among children in crowded asylums, soldiers in camp, or the inmates of filthy correctionary institutions, jails, etc.—it may develop under circumstances in which there is no possibility of infection by contact.

As far as pathological appearances go, there is very little if any difference between severe purulent ophthalmia and the virulent type of so-called gonorrhœal ophthalmia or conjunctivitis. I think it is impossible to differentiate them from appearances alone; some eminent surgeons claim that they can do so, but I am free to confess that I have never been able to understand how such a differential diagnosis is possible, excepting in the rare instances in which the dis-

ease can be traced directly to infection with virulent urethral discharge. The discovery of the gonococcus may, however, prove invaluable in the differential diagnosis.

The results of ocular infection by the discharge of a virulent urethritis, the secretion of the severe forms of purulent ophthalmia, and the secretion of the form of conjunctivitis in which the gonorrhœal origin of the disease has been traced, are alike; the secretion of any of these forms of conjunctivitis will produce urethritis if inoculated upon the urethra.*

It takes but a few hours for a virulent conjunctivitis to destroy the sight. The cornea, as is well known, is supplied at its periphery with nutritive material from the blood-vessels of the conjunctiva and the sclera, hence it is not very well nourished. When there is severe congestion of the conjunctiva the cornea is apt to break down—not having blood-vessels of its own, and its vitality being therefore of a low grade. There is constant pressure from the interior of the eye, and when the cornea softens it ruptures and protrudes in the form of staphyloma. Such a result is by no means characteristic of purulent conjunctivitis of proved gonorrhœal origin; it may be caused by the ordinary type of purulent ophthalmia, hence is not of much assistance in the diagnosis. We

* Dr. F. N. Otis inoculated the pus of ophthalmia neonatorum upon the male urethra, with a resulting urethritis.

must admit, however, that such disastrous consequences are, as a rule, much more likely to occur from true gonorrhœal ophthalmia—*i. e.*, of known gonorrhœal origin—than from ophthalmia due to other causes. This, however, may be dependent upon the more uniform severity of the disease rather than any special property of the virus.

It is probably true that the majority of cases of purulent ophthalmia depend upon bacterial infection. Even in mild cases, where the condition has lasted until it has become more or less chronic, a single child suffering from ophthalmia of an apparently simple nature will, if introduced among a number of other children, be liable to cause an epidemic of the disease among them by infection. A single case in a public institution will very often infect in varying degrees all the children congregated therein; the more crowded the institution and the more sickly the children, the worse the resulting infection will become.

A single case of purulent ophthalmia in a crowded barrack is quite likely to infect a large number of soldiers. We are more or less familiar with the history of endemics of this disease as occurring during war times. It occurs in the same way and from the same causes as a great many other infectious diseases; poor food, cold and wet, overcrowding, vitiated constitutions, and filth, in combination with simple inflammation, will give rise to the disorder.* With

*The effects of "crowd poison" in developing infectious diseases are well known.

these circumstances of environment, secretions from the eyes of individuals affected with simple inflammation may finally develop the poison of this disease. In other words, we may finally have among such people the evolution of types of ophthalmia varying from the mild catarrhal form of conjunctivitis to the virulent and inevitably destructive form, all due to the spontaneous development of purulent ophthalmia. I am not aware that serious epidemics of contagious ophthalmia have in the majority of instances been satisfactorily traced to gonorrhœal contagion. During my hospital service I saw many cases of severe purulent ophthalmia in the adult, both male and female, but, to the best of my recollection, few if any of them were positively traced to gonorrhœal infection.

Ophthalmia neonatorum is said to be produced by gonorrhœal infection from the mother during parturition, but in a by no means inconsiderable experience with this disease in hospital practice I do not remember to have seen a single case in which indubitable specific vaginitis existed in the mother. It certainly would have been unfair to attribute all the cases of leucorrhœa in the pregnant women in the hospital to gonorrhœal infection, yet quite a proportion of the children—where prophylactic precautions were not taken—suffered from ophthalmia. I am inclined to attribute such cases in a large proportion of instances to infection with the acrid and decomposing discharges

from uterine inflammation (the morbid qualities of which are dependent to a certain extent upon constitutional depravity in the mother) and the vitiating influences of a hospital atmosphere; they are certainly due to bacterial evolution of some sort.

It is somewhat extraordinary, in view of the correlation of virulent urethritis and purulent ophthalmia, that there are so few cases of gonorrhœal infection of the eye, for patients are notoriously careless and are rarely warned of the danger. I recall a very sad case in this connection:

A young man of 18 contracted gonorrhœa, and, in his ignorance, was careless enough to inoculate his eyes, with the unfortunate result of total blindness. A little boy of 7, who slept with him, also contracted ophthalmia, and he, too, became totally blind.

Cases of this kind serve as a special warning against carelessness in handling the eyes after attending to the genitals in cases of gonorrhœa, and this danger should be impressed upon the patient.

The virus of urethritis is not only capable of affecting the mucous membrane of the eye, but has been known to infect that of the rectum. Numerous instances of rectal gonorrhœa have been reported. An interesting account of an endemic of gonorrhœa arising from the practice of sodomy is given by Dr. R. Winslow (Medical News, August 14, 1886). The endemic occurred in an asylum for children near Baltimore, and was started by a boy who was infected

with urethritis by a woman outside of the asylum. This lad subsequently practiced sodomy with another boy inside the institution, and, as this disgusting practice was quite prevalent among the inmates, ten or more cases subsequently developed. An inspection of the rectum of one of the lads from whom another had contracted urethritis showed the mucous membrane to be hyperæsthetic, intensely reddened, bathed with pus, and inclined to bleed when handled.

Apropos of unnatural methods of contracting urethritis, I have elsewhere* mentioned in connection with the subject of sexual perversion a case in which a number of boys in a fashionable neighborhood were infected by a negro hypospadiac, who was also a sexual pervert.

Mr. Milton† is rather emphatic in his claim that a specific virus is necessary to the production of gonorrhœa, and that simple discharges in the female cannot possibly produce it. He seems to base his opinion largely upon the degree of severity of the resulting inflammation. Thus, in commenting upon a statement made by Fordyce Barker, that simple intrauterine inflammation may furnish an acrid discharge capable of causing urethritis in the male, he says: "One case would have been enough *had it been shown*

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* A Lecture on Sexual Perversion, Philadelphia Medical and Surgical Reporter, September 7th and 18th, 1887.

† Gonorrhœa and Spermatorrhœa, 1887.

that the disease was not simple urethritis, but real gonorrhœa accompanied by chordee, swelled testicles, irritable bladder, sympathetic pain, etc." (Italics mine.)

This would imply that there is but one grade of true "gonorrhœa," and that a severe and characteristic form. If this be true, then gonorrhœa is the only infectious disease of which it can be said. Urethritis, even allowing that the cause were the same in every case (*i.e.*, specific in all cases), would still show varying grades of severity dependent upon individual susceptibility and varying habits of the person affected. It is an easy matter to convert a simple urethritis into a virulent type of the disease. The introduction of instruments, sexual excitement, debauch, are all sufficient to produce a series of severe complications in a previously simple urethritis.* Milton goes further to show the invariably specific character of gonorrhœa by advancing the fact that "country places and small towns are quite free from the disease." In answer to this, I would say that the environment afforded by a large city favors all kinds of infectious diseases, and the women of a metropolis are, as is well known, more subject to gynic disorders than their country sisters. This, as far as it goes, is rather an argument in favor of the spontaneous and simple

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*According to Milton, therefore, a case of simple inflammation in which serious complications are induced by irritant injections, etc., necessarily becomes a "true gonorrhœa."

origin of urethritis. It is conceivable that, under the enervating and disease-fostering influences of city life, women are not only likely to suffer more often from gynic diseases than those living in the country, but the discharges produced by these disorders are likely to be more putrescible and more acrid. While the morals of a small town may not be of the best, yet prostitution, in the true sense of the word, is not apt to exist to any extent. Even in country places, however, cases of urethritis are apt to arise, and, when traced to their source, will be found to have originated in some particular female who is enjoying a monopoly of prostitution in that particular locality, and who perhaps has had no opportunities of intercourse with infected individuals from the city.

I do not wish to be understood as claiming that a case of ordinary leucorrhœa is apt to cause a virulent urethritis. It will, however, under favorable conditions, cause a urethritis of a simple type, which, under causes of irritation, may become virulent. However mild it may be, the discharge of a simple urethritis may, by cultivation, become virulent (*i.e.*, "specific"), after which it excites in probably the majority of instances virulent inflammation. Again, I do not assert that the discharge of a simple urethritis will infect a woman with virulent vaginitis; but I believe that, after its deposition in her vagina and admixture with semen and other putrescible secretions, a poison may be elaborated which will impart a virulent urethritis

to the next unlucky wight who receives her favors. The gradual development and intensification of the poison in her vagina may acclimate the mucous membrane, thus explaining her own escape from infection. Admitting that the position taken may be incorrect regarding the earlier cultures, I still maintain that it is true regarding later cultures of the products of putrefaction. The acclimation of the vagina to autogenetic poison must be admitted, if we would explain the non-existence of vaginitis in women who are capable of imparting virulent urethritis.

The stage of incubation is by some asserted to be a proof of the invariably specific nature of urethritis, but I fail to see that it has any bearing whatever upon the question of specificity. Urethritis comes on at a very unreliable period after exposure; if the canal of the male be healthy, the discharge may not appear for several days; if already damaged, it is apt to come on in a few hours. I have seen simple cases which are said to have come on a week or ten days after exposure; and, on the other hand, I have seen virulent cases develop in a previously healthy urethra on the second day. Giving fallacious histories their due meed of consideration, there will still be a lack of uniformity in the period of so-called incubation. More of the late cases are apt to be virulent because of the relatively greater number of damaged canals and consequent preponderance of cases of simple urethritis. Thus we see a relatively small

number of late cases of incubation, and these are usually virulent, but we see a large number of early cases of which the greater proportion are simple and the smaller proportion eventually become virulent. As has already been stated, men who have had previous attacks of gonorrhœa usually develop simple urethritis, and this comes on early.

Inspired by the doctrine of specificity of gonorrhœa, and coincidently by recent discoveries in the field of microscopical research in relation to the germ theory of disease, numerous investigators have endeavored to demonstrate the parasitic nature of the virus of gonorrhœa. During the last quarter of a century several authors have claimed to have discovered the germ or organism upon which the disease depends, but none of their views have been generally accepted by the profession. The latest aspirant to microscopical honors in the study of urethritis is Neisser, of Breslau, who in 1879 asserted that he had discovered the specific microbe of gonorrhœa, which he termed the gonococcus. Numerous European bacteriologists published confirmatory reports regarding this micro-organism, and during the last few years several American experimenters have endorsed the views of Neisser. The alleged specific germ has been found in the pus-corpuscles. Its detection under the microscope was made possible by certain complicated processes of staining with coloring matter. A little later, Drs. Wendt and Allen, of New York City, dis-

covered the bacillus in the following rather simple manner: A drop of pus is spread into a thin layer by pressing between two glass slides, and allowed to dry in the air. A drop of solution of methyl blue in anilin water is now placed upon it for a moment and washed off with a stream from a wash-bottle. A few drops of Gram's iodo-iodide liquid are then poured on and allowed to remain for several minutes; this fixes the color of micro-organisms in general. Gram's liquid is now washed off, and, while the specimen is still wet, a cover-glass is placed upon it and it is examined with an oil immersion lens. If micro-organisms resembling the gonococcus are found, they are tested by decolorization. The cover-glass is removed, and the specimen treated with absolute alcohol until the color is as completely removed as possible. The cover-glass is replaced, and the specimen examined, when all the gonococci will be found to have disappeared; all other organisms, however, which have been present will be distinctly visible.

The gonococcus, as described by Neisser, was developed from the pus-corpuscle by staining with methyl violet and dahlia. It is located generally upon the surface of the pus-corpuscle; more rarely upon the surface of the epithelium. Sometimes it is incorporated with the corpuscle and replaces its nucleus, which disappears. The microbe is large and spherical when single; in some instances two of them unite together in a sort of biscuit shape. They are

usually found in colonies of ten to twenty or more, surrounded by a kind of mucous envelopment.

Gonococci from Gonorrhœal Pus. (After Finger.)

For practical purposes the simpler methods of examination of suspected fluids are best. A drop of pus, placed upon a cover-glass, may be spread into a thin layer by placing another glass upon it and sliding the two apart. One of the glasses is then thoroughly dried by passing it rapidly through the flame of a spirit lamp. The cover is now dipped in a solution of methyl blue, and the superfluous coloring matter washed off by a stream of cold water. It should now

be mounted in Canada balsam. Neisser has more recently laid especial stress upon the tendency of the gonococci to arrange themselves in pairs. This, he claims, distinguishes them from the urethrococci, which are found singly or in irregular clumps. He also says that the gonococci are found in or upon the pus-corpuscle, never outside of it. One important source of fallacy at once suggests itself. It is by no means improbable that the urethrococcus may undergo modification by virtue of the existence of a virulent inflammatory process, as a consequence of which it tends to arrange itself somewhat differently and to invade the pus-corpuscles. This is certainly consistent with the evolutionary theory. Taken singly, the urethrococcus and gonococcus are identical in appearance.

Neisser has claimed that by pure cultures of the gonococcus he has been able to induce specific inflammation upon previously healthy mucous membranes. Bumm has experimented in this manner upon a couple of medical students, with, he claims, a successful result. As the students were not under lock and key, and the students in European capitals are not distinguished for their virtue, these experiments are open to impeachment.

In spite of the positive assertions of the experimenters mentioned, the causal relation of the gonococcus to virulent urethritis is not yet generally accepted by the profession. Equally competent ob-

servers have apparently demonstrated the existence of the so-called gonococcus in the normal secretions of the urethral canal; others have failed to detect its presence in the secretions of a virulent discharge. I think that it is as yet too early to pass an opinion upon the accuracy of the observations of either those who affirm or those who deny the dependence of gonorrhœa upon the gonococcus. I am inclined to believe that the disease is of microbic origin, and it is possible that the gonococcus bears a causal relation to it. I do not think a positive demonstration of the dependence of virulent urethritis upon this micro-organism would in any way controvert the evolutionary theory of the origin of the disease which has already been outlined.

There are several questions to be considered in estimating the importance of the gonococcus or any other micro-organism which may subsequently be detected in gonorrhœal discharges by improved methods of examination:

1. In the first place, it remains to be shown in any case of disease of probably microbic origin whether the pathological effects are due to the microbe *per se*, or to some peculiar toxic compound which it generates. It is possible that through evolutionary changes involving the decomposition of discharges of various kinds a microbe is developed in the female vagina which gives rise to the formation of a peculiarly acrid poison analogous to ptomaïnes or leucomaïnes. This

hypothetical poison, when inoculated upon a healthy urethral mucous membrane, would in all likelihood produce urethritis of a grade varying with the intensity of the virus and the susceptibility of the mucous membrane.

2. Although the gonococcus may subsequently be proved to bear no relation whatever to the causation of so-called specific urethritis, the disease may yet be of microbic origin, the microbe being a form developed only in the favorable environment of the female vagina and not yet detected by any method of research.

3. Again, the microbe which primarily produced the irritating poison or virus, through the medium of decomposition of organic fluids, might perish or become inactive, being unable to live in its own products, and the urethral discharge would not reveal its presence.

4. It is by no means necessary that the specific properties for evil possessed by certain micro-organisms should be demonstrable by any peculiarity of form or reaction to various methods of staining.

5. Admitting that the gonococcus is found in the normal secretions of the male urethra, it might still acquire through inoculation of the urethra with certain secretions, or some poison from the female vagina, infectious properties by virtue of which it could transmit virulent urethritis or vaginitis to healthy individuals, without having undergone any

change in its own physical characteristics, save in its grouping or perhaps its reaction to chemical agents.

Thus, from what has been said, it may be observed that: 1st, I do not consider the absence or presence of any particular form of microbe as an irrefutable argument for or against the microbic origin of the disease. 2d, I do not believe the presence of any special form of microbe can possibly refute the theory of the spontaneous and non-specific origin of virulent urethritis; *per contra*, I hold that the demonstration of the specific germ would be a most positive evidence of the correctness of the evolutionary theory of the origin of gonorrhœa. 3d, Notwithstanding my belief in the dependence of urethritis of a virulent type upon a microbe, I am not yet prepared to accept the gonococcus as *the* microbe. I believe that bacterial organisms are unquestionably at the bottom of all cases of virulent infection—and possibly many simple cases—yet I doubt if their constancy of form has as yet been demonstrated. They are probably the lineal descendants of those innocuous germs which exist all about us, or more likely those normally present in the vagina and urethra. It is possible that certain germs present in the atmosphere, and which are the source of the decomposition of discharges of all kinds, whether from wounds, or from inflammatory or normal processes in the urethra or vagina, may bear an etiological relation to gonorrhœa. It is worthy of note in considering the relation of the gonococcus to gonor-

rhœal processes, that observers have claimed its discovery in the secretions of purulent ophthalmia, in the fluid of gonorrhœal arthritis, and in the pus of pyosalpinx. Inasmuch as pyosalpinx particularly has been claimed to depend upon antecedent gonorrhœal infection of the female, the positive demonstration of the specific nature of the microbe of Neisser would be decidedly interesting. Gonococci have been found in numerous cases of pyosalpinx, but they are by no means necessary to prove the gonorrhœal origin of tubal disease. Some cases are doubtless due to secondary mixed infection. The same is true of joint and muscle complications.

In explanation of the apparent contraction of virulent urethritis from females who are free from specific disease, the theory has been advanced that, as a result of gonorrhœal infection, the glands of Bartholin and the mucous follicles of the *cervix uteri* become infected, this infection lasting for a long time after visible evidences of specific vaginitis have disappeared. It has also been observed that gonorrhœal inflammation may localize itself and become chronic in and about the *cervix uteri*, this chronic inflammation giving rise to the constant formation of a highly infectious secretion. If such cases exist, they might escape detection even on very careful examination, and thus give rise to the idea that gonorrhœa had been contracted from a perfectly healthy woman. I have seen cases apparently supporting this view.

One of the most interesting theories that has ever been promulgated regarding the effects of gonorrhœa was advanced some years ago by Dr. E. Nöggerath, of New York City. This theory implies that there exists in every man who has suffered from a gonorrhœa a latent condition of disease with absolutely no external evidences which can lead to its detection, and that this condition of disease is capable of exciting a varied train of morbid results in the female, such as uterine and peri-uterine inflammations, salpingitis, and, coincidently, sterility. Very few theories, indeed, in the science of medicine have been greeted with more ridicule than this; but the present age is a progressive one, and it is a remarkable fact that many of those who scouted the idea of Dr. Nöggerath are now convinced that he was more than half right. It is certainly true that diseased patches, with or without stricture, may exist in the urethra for years without giving rise to external evidences of disease; and recent observations have indicated that in all probability the secretion from these lesions may be infectious, to a sufficient degree, at least, to enable it to produce uterine and ovarian diseases in the female.* It is perfectly logical to assume that the conditions of environment which prevail behind an organic stricture

*Such conditions in the male are analogous to the chronic infectious processes found in the vaginal vault in the female in some cases, which impart urethritis while the woman herself remains apparently healthy.

in the urethra are, like the analogous conditions which prevail in the female vagina, extremely favorable to the continuous development and perpetuation of irritating secretions. *It is possible, moreover, that, as a result of adaptation to the new environment behind the stricture, this poison may lose its original property to induce virulent vaginitis, and become transformed into a virus or organic chemical compound of microbic origin, which is very irritating to the lining membrane of the uterus and Fallopian tubes, and, incidentally, to the peritoneum investing the pelvic organs.*

The profession is fast becoming impressed with the clinical evidences which support this view, whether the explanation suggested be correct or not.

Long before the possibility of latent gonorrhœa had been generally accepted—as it now is—I had been very much impressed by the opinion which prevailed in the minds of the wives of certain individuals whom I had treated for stricture and vesical troubles (secondary to gonorrhœa) of long standing, that certain uterine and pelvic troubles by which they were affected were in some way attributable to genito-urinary disease in the husbands. I can recall without effort at least a dozen cases in which I have been called upon to treat the wives of patients whom I have attended for chronic urethral troubles, who were suffering with uterine and ovarian disease, and who have asked me whether I did not think that the troubles for which I had treated their husbands were responsible for their own ailments.

These cases I once offered merely as a suggestion, but at the present writing I have plenty of support for the opinion that Dr. Nöggerath foreshadowed a more important pathological truth regarding gynic disease than has ever been evolved by the minds of those whose principal characteristic seems to be an insatiable antipathy to the female ovary, resulting in its indiscriminate and very often unwarantable removal. Indeed, at the present writing Nöggerath's views have practically revolutionized modern gynic pathology.

Fournier's statistics regarding the class of women who are most likely to communicate urethritis are interesting. He formulated from an investigation of the origin of a number of cases of gonorrhœa the following suggestive table:

Cases contracted	from	unregistered women....	44
"	"	" kept women	138
"	"	" shop girls...	126
"	"	" domestics.....	41
"	"	" married women	26
"	"	" registered prostitutes...	12

As far as this table goes, it tends to show—what sad experience has taught many unlucky individuals—that clandestine prostitution is relatively much more dangerous than what may be styled, for the sake of argument, the legitimate type. This proposition holds true in this country as well as in Paris, and, as a matter of fact, it will be noticed, on careful observation, that the better class of prostitutes are not very

likely to give gonorrhœa. The class of men who patronize such women are not—unless drunk—apt to have intercourse with them while suffering with urethritis, hence the women are not liable to contract virulent vaginitis by contagion. They are very careful of their persons and remarkably cleanly, habitually irrigating the parts after intercourse, not only for the purpose of preventing infection, but, according to their notions, to sustain their general health; indeed, the average better-class prostitute is as careful of herself as is a fancier of a high-bred horse. She is not likely to communicate a chancroid, which is another filth disease, and, if her patrons contract anything, it is, as is well known, most apt to be syphilis. The reason for this is obvious. A woman suffering with chancroid, vaginitis, or marked uterine disturbance is more or less incapacitated for continuing her vocation on account of the great discomfort attendant upon sexual intercourse. She is also apt to have her case attended to at once, as her attention is immediately called to it. Unless she be very low in the scale, she can afford to suspend her occupation until she has recovered, and will do so as a matter of business if nothing more. If she does not do so voluntarily, the keeper of the brothel is apt to compel her.

Chancroid and gonorrhœa are at least congeners, and are essentially filth diseases, hence the lower class of prostitutes most frequently originate them. The better class are apt to convey syphilis quite

innocently, because the local lesions of syphilis in women are usually of a trivial character. A mucous patch, chancre, condyloma, or tubercle upon the genitalia of the female is not apt to inconvenience her greatly, and she is likely to be unaware of its existence. In perhaps the majority of instances of syphilis in the female we are unable to detect any primary lesion whatever. As a general rule, the local lesion has disappeared long before she knows she has syphilis. The fact is, that true chancre is clinically quite exceptional in women, and only occasionally is the typical sore to be met with. I do not believe I have seen more than twenty cases of classical indurated chancre in the female in quite a large hospital and dispensary practice; it is still more exceptional in private practice. The primary lesion is usually either of an apparently mixed type, or the induration is so slight that it escapes observation. The classical hard chancre is comparatively rare even in the male; it is excessively rare in the female. The fact of a woman having no history of a local sore, therefore, counts for but little in the matter of diagnosis of syphilis.

The opinion is entertained in certain scientific quarters that gonorrhœa and chancroid are more or less closely related, and, as I have elsewhere indicated,* I am inclined to believe in the correctness of

* The Evolution of the Local Venereal Diseases.—New York Medical Record vol. xxxvii, No. 2.

this view. It would appear that there exists between the grades of inflammation of the urethra which are designated as simple urethritis, and the typically virulent form of the affection, varying grades of severity. In the same manner there exist varying types of tissue-destruction between simple balanitic or herpetic ulcerations, and typical chancroids. These variations of form do not necessarily constitute evidences of a variation of origin, for, reasoning from an evolutionary standpoint, it is conceivable that the same primal cause may, through differentiation, produce widely varying results. It is also a logical evolutionary inference that gonorrhœa and chancroid originate from identical factors of environment. Subsequent modifications of environment necessarily produce variations in the cultures of the primordial poison of these diseases, which finally result in a divergence of type so pronounced as to permit differentiation into two distinctive classes of disease. Both forms of venereal affection may be designated as filth diseasės, and it is a striking fact that they are very frequently associated in cases contracted from intercourse with the lower-class prostitute. I have known of instances in which gonorrhœa and chancroid were both contracted from the same woman —in one case a double infection, and in another by two different patients. Upon examination, the woman presented no evidences of either specific vaginitis or chancroid. If the virus of a virulent

urethritis be inoculated upon a healthy and cleanly integumentary surface, nothing more than an irritation, or perhaps simple localized inflammation, is set up; if, however, we transfer it to a cachectic individual, we may induce more or less suppurative inflammation — perhaps sloughing — and necessarily the products of this inflammation will be more irritating than those from the same process occurring in a healthy individual. I do not claim that by transferring gonorrhœal virus from patient to patient, typical chancroid can be developed, but if we transfer it to abrasions upon the genital tract of a woman suffering with uterine disease, and who is very uncleanly and indulges in excessive intercourse, it is probable that an ulcer would result which could with difficulty be differentiated from chancroid, and if the secretion of such an ulcer be again and again transferred to a favorable environment, or undergoes decomposition, it is probable that sooner or later the poison of a typically virulent chancroid will be developed. I wish not to be misunderstood in this matter, for, although I believe gonorrhœa and chancroid are identical in origin and clinically closely related, I at the same time acknowledge that, in order to demonstrate their relationship by causing a typical form of one with the poison of the other, it would be necessary to obtain certain peculiar circumstances of environment for each culture, and this is obviously very difficult to accomplish experimentally. Through the medium of illicit and uncleanly intercourse, however, facilities

are offered for the spontaneous development of the poisons of chancroid and gonorrhœa, and perhaps for the transformation of one into the other, which can never be secured by the scientist. It is possible that, in order to obtain the transformation of the chancroidal into the gonorrhœal poison, there would be required the intervention of certain peculiar local and constitutional conditions which are too occult for detection. It is certainly absolutely impossible for us to obtain experimentally the various factors which I have outlined as tending to evolve the poisons of chancroid and urethritis.

One of the most frequent apparent evidences of the correlation of chancroid and urethritis is the appearance of seemingly typical lesions of the former during a virulent attack of the latter disease. In such cases a second exposure or late appearance of chancroid is usually suspected, in spite of the history given by the patient. While this suspicion may be justifiable in some cases, I do not think it is in the larger number. Chancroid will be found to occur usually in uncleanly and perhaps intemperate men with a long prepuce. Here we have the necessary environment for a reversion—or perhaps a higher differentiation—of type in the virus of the urethral inflammation.* Women with virulent vaginitis and

*The possibility of a reversion of type of disease germs, under certain circumstances of environment, is well worthy of our serious consideration.

chronic gonorrhœa will be found either to have chancroids present, or a history of their existence at some time during the progress of the case, in by far the majority of instances in hospital and dispensary practice. This is not true of the more cleanly class of females.

I have seen numerous cases illustrating the correlation of gonorrhœa and chancroid. I recall two recent cases in private practice, which are very pertinent as bearing upon this point. In one, a young man had a virulent urethritis for several weeks, at the end of which time he developed a balanitis. Within a week inflammatory phimosis occurred. Two weeks later, chancroids appeared at the preputial orifice—that the sores were chancroids was shown by autoinoculation. In a few days thereafter I incised the prepuce upon the dorsum, and, upon laying the glans bare, found no sores whatever, but the usual evidences of balanitis with excoriation. Not only did this patient deny exposure after the appearance of the gonorrhœa—and he was worthy of belief,—but the condition of the organ was such as to make exposure so uncomfortable as to be highly improbable. In another case chancroidal ulcerations and suppurating bubo followed a balanitis, secondary to gonorrhœa, in an uncleanly patient who had not been exposed for many weeks.

CHAPTER II.

VARIETIES OF URETHRITIS.

Two forms of urethritis are usually described, the simple (non-specific) and the virulent (specific). I do not like this classification, because I believe there is essentially no difference between the simple form and the so-called specific urethritis. I object to the term "specific," as applied in the sense that the disease always results from contagion by sexual intercourse with a female suffering from a virulent vaginitis or other virulent lesion of her genital tract, or that the poison is always the same in its intensity and in its results. I will therefore divide the disease, for the sake of description, into venereal and non-venereal urethritis. These may be subdivided into virulent and non-virulent, gonococcal and non-gonococcal (according to the intensity of the inflammation). We are apt to meet with cases of non-venereal, non-virulent urethritis which, from various causes, become apparently virulent in character, and may also see cases of venereal urethritis which remain simple or non-virulent throughout their entire course. Whether gonococci may appear in the discharges of a urethritis primarily simple, is open to question; they may certainly reappear after they have disappeared in cases primarily gonococcal.

Before proceeding further, I wish to explain more fully my own meaning when I use the term "specific"

in the consideration of urethritis. I do not believe the ordinary acceptation of the term is correct as applied to gonorrhœa. I believe that a distinct correlation exists between all of the various forms of urethritis, whether simple or virulent in character, and that (with the exception of the traumatic, chemical, and other forms not dependent upon sexual intercourse) they all originate by inoculation with the decomposing products of simple inflammation or uncleanly secretions. I believe that the most logical explanation of the origin of the virus of gonorrhœa is that it develops *de novo* in the female from the decomposition of leucorrhœal, menstrual, or seminal discharges, and originates in the male by intercourse with uncleanly—but not necessarily diseased—women. As a consequence of heat and moisture, which constitute a favorable environment for such decomposing discharges—especially in the female vagina—there is developed a highly irritating secretion, or, if the process be further advanced, a highly virulent form of contagion—dependent on the gonococcus, if you please. Now any simple inflammation may, through the medium of a favorable environment and by a process of microbic evolution in its secretions, develop the poison of so-called specific inflammation—specific only in the sense that when its products are transferred to a healthy mucous membrane there will be produced, *cæteris paribus*, an inflammation in the healthy soil precisely like that from which the irri-

tating and infectious materials were derived. If successive cultures of the products of specific inflammation (the gonococcus?) were made upon healthy and cleanly soil, attenuation of the virus would, I believe, eventually result, and, as a consequence, there would be developed first a material capable of exciting merely simple inflammation, and finally a material absolutely non-irritating.

As a corollary of what has been said—if the statements be correct—it is obvious that there is a correlation between simple and specific causes of inflammation of mucous membranes, so that after a certain length of time, by a process of evolution—which controls the development of bacteria quite as much as it does the development of human beings and animals of all kinds—there will be developed from the products of a simple mucous inflammation an infectious form of microbe, with its attendant toxins, which, when transferred to a new and favorable locality, will generally develop an inflammation precisely like that from which the infectious material was derived. This would explain why once in a while we encounter several individuals who have contracted different degrees of the disease by intercourse with the same woman, while others who have been similarly exposed have altogether escaped infection. There must be some explanation for this, for if each of these individuals—leaving individual susceptibility out of the question—has had intercourse with a

woman suffering from specific vaginitis or other specific genital inflammation, there should be no difference in the character of the disease contracted.

There must consequently have been some inflammatory condition existing in the female which gave rise to products varying in virulent properties *pari passu* with the advancement of decomposition. At one time in the history of the vaginitis—or filthy condition of the vagina, as the case may be—the secretions were probably not very acrid, but they became so acrid through decomposition (*i. e.*, the evolution of bacteria or cocci) that they finally constituted a virulent form of poison the intensity of which varied according to the degree of development of the bacteria; hence, during the progression of inflammatory changes and decomposition of secretions in the female, one individual is liable to contract from her a mild attack of urethritis, while another may escape it entirely. Later on in the morbid condition of the vagina some unlucky individual is liable to contract a virulent and severe urethritis, with or without gonococci. It is safe to infer that the development of bacteria has much to do with the degree of virulency of uterine and vaginal discharges, and that successive cultures of the bacteria will necessarily vary in intensity according to their environment.*

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*The excellence of the uterus and vagina as a culture bed for pathogenic bacteria is well illustrated by recent re-

To sum up: I hold the view that, as a consequence of the peculiar tendency to decomposition of uterine and vaginal discharges, and the existence of the circumstances of heat, moisture, and imperfect ventilation—which, as is well known, constitute a favorable environment for the development of micro-organisms—there are cultivated in the vagina germs of as yet indeterminate form, and one variety which has been demonstrated—the gonococcus. The parent stock of these germs consists of primarily innocuous micro-organisms derived from the atmospheric air, or present in normal secretions of mucous membranes. By successive cultures of these germs there is finally evolved a form of micro organism which is possessed of very virulent properties, and which, later on, under almost all circumstances produces in a healthy and susceptible mucous membrane the so-called specific inflammation.*

I will call attention to the fact that, even admitting that the poison, germ, or virus of the so-called specific inflammation is invariably the same in origin,

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searches in the pathogenesis of diseases of the puerperium. As is now well known, streptococci are found in the normal secretions of the female genitalia. It is by no means impossible that the gonococcus may result from a transformation of these germs.

* It is to be understood that these pathogenic microbes may act indirectly, *i. e.* through the medium of their chemical products.

its effect may be modified by several circumstances, these being: (1) the degree of elaboration of the poison, *i. e.* differentiation; (2) its dosage; (3) the length of time during which the mucous membrane is exposed to its influence; (4) the character of the soil upon which it is implanted; (5) individual susceptibility or idiosyncrasy.

The correlation of mild and virulent cases of urethritis is therefore similar to that which prevails between some forms of apparently simple sore throat, and classical diphtheria. No practitioner of a logical mind disputes the easily demonstrable fact of the existence of varying grades of diphtheritic infection, but it is a singular circumstance that the assertion of the same correlation of various forms of urethritis or venereal ulcers is apt to be repudiated.

There are certain pronounced characteristics presented by a case of typically virulent urethritis which distinguish it in a measure from the simple form: the discharge is more profuse; there is a greater degree of inflammation; there is more pain; and extreme chordee, inflammatory exudate and swelling are more apt to occur. The discharge is greenish, thick, and nasty-looking, and contains more or less blood. These, however, are differences of degree and not of kind, and do not necessarily imply specificity in any particular case of inflammation of the urethra, for a simple case may at any time present these virulent features as a result of cold and wet, traumatism, dis-

sipation, sexual indulgence, or strong injections, and under such circumstances it is impossible to differentiate it from those cases which are primarily virulent —unless the gonococcus be accepted as the criterion and its presence or absence demonstrated. Even here we are apt to be misled, for the gonococcus may be present in mild cases and absent in severe ones. Mr. Milton, however, as already remarked, accepts these severe symptoms—especially if inflammatory complications involving the prostate, bladder, testes, etc., occur—as indubitable evidences of a specific origin. This position is absolutely untenable, *the more especially as most of the complications which he believes to be evidences of specificity are secondary mixed infections and in no sense due to gonococci.*

Various complications of virulent urethritis, such as vesical inflammation, peri-urethral abscess, prostatitis, and epididymitis, have been supposed by some observers to be characteristic of specific infection, but, as a matter of experience, they, too, are dependent upon the degree of inflammation and the facility of transference of infectious products independently of the degree of inflammation, and not upon any specific properties *per se*, as shown by the fact that, as a consequence of various causes of irritation, such complications may occur in very simple forms of urethritis. So simple a procedure as the passage of an ordinary steel sound into the urethra will sometimes excite violent inflammation and all possible gonorrhœal

complications in cases of slight catarrhal inflammation of the canal, and the same result is in rare instances brought about by bungling instrumentation of the healthy canal. Many of these phenomena are due to secondary infection, possibly with toxins, possibly with pus microbes. Traumatism may be, then, the starting-point of secondary mixed infection which in no wise depends upon the gonorrhœal specificity of the urethritis. Indeed, most of the complications of gonorrhœa are secondary mixed infections.

SIMPLE URETHRITIS.

The subject of simple urethritis requires special consideration. Under the generic term of mild or simple inflammations I will include:

1. Those due to causes independent of sexual intercourse (non-venereal urethritis).

2. Those due to sexual excitement or indulgence and intemperance in the presence of chronic morbid conditions of the urethra (not necessarily venereal).

3. Those due to inoculation during intercourse with irritating materials of a comparatively mild character (necessarily venereal, but not indicating a high culture of the *materies morbi*).

The terms "simple" and "virulent" as applied to urethritis are perhaps objectionable as indicating an arbitrary differentiation between the two grades of inflammation. The division into gonococcal and non-gonococcal is susceptible of arbitrary application

where the practitioner is familiar with microscopical technique. As already remarked, however, the presence of the gonococcus is no criterion of the severity of the inflammation. Such diathetic conditions as rheumatism, struma and gout play an important rôle in simple urethritis, and patients thus peculiarly constituted are more prone to its development than other individuals, more particularly if the canal has been previously damaged. In persons who are constitutionally healthy we may meet with urethritis due to certain chemical causes—for instance, strong injections. A great many patients take injections immediately after coitus, to prevent the development of a possible gonorrhœa, and, as a consequence, simple urethritis of a greater or less severity is sometimes set up which is purely chemical in origin, but which in the severer forms cannot be differentiated from cases due to contagion. The celebrated experiment of Swediaur, who produced a violent urethritis upon himself by the injection of a solution of ammonia, is a familiar illustration of the possibility of urethritis of an apparently virulent type from chemical irritation.

The passage of an instrument into a canal that is affected by stricture or congested patches is quite apt to aggravate the existing chronic inflammation, and, as a result, there occurs a simple traumatic urethritis. In some instances the instrument cannot again be passed for some days—until the inflammation has had time to subside. Certain drugs taken internally, such

as turpentine and cantharides, may give rise to the condition known as strangury, which is an inflammation of the neck of the bladder and urethra. We note in such cases a more or less scanty secretion of urine. The patient may be able to pass but a few drops at a time, micturition being painful, and the urine to a greater or less degree mixed with blood. The direct and reflex irritation produced by prolonged sexual excitement may give rise to urethritis, particularly in patients of a gouty or rheumatic diathesis, who live high and drink to excess, but I do not believe this cause is capable of exciting inflammation if the canal be perfectly healthy; it is very apt to develop, however, if the urethra is more or less damaged by a stricture or patches of congestion, or is in a condition of chronic catarrh from antecedent gonorrhœa. Here is a case in point:

A young man came to my office a short time since, complaining of a urethral discharge. He said he had been married only two weeks; that he had had nothing to do with women for five or six months previous to marriage, but prior to that time had indulged in sexual intercourse quite frequently. He had experienced several attacks of gonorrhœa a year or two before. About a week after marriage he discovered what seemed to be a severe clap, and his friends referred him to me, thinking that such was really the case. I immediately suspected an old stricture, but was unable to make an examination

until the acuteness of the inflammation had subsided, when I found three strictures of varying calibre in the pendulous portion of the canal. It was the irritation and obstruction produced by these that caused the urethritis. As a consequence of his abstinence for five or six months, the patient had become sexually voracious; being naturally very passionate, and, like the average man, inconsiderate, he indulged excessively as soon as the opportunity offered. The congestion thereby produced, superadded to the morbid condition left by his old gonorrhœa, resulted in an acute inflammation. In brief, as a result of excessive coitus with a damaged urethra, he was suffering from acute urethritis.

This is an apt illustration of a large class of cases with which we meet in the treatment of diseases of the genito-urinary system. There are other cases something like this: A married man with urethritis and retention of urine came to me a few days ago for treatment. It so happened that I knew something about his family history, having treated his wife for leucorrhœa and uterine trouble On this account I might have supposed that the patient contracted his trouble innocently. Knowing, however, that a man who cohabits regularly with a woman with uterine disease becomes more or less tolerant of her otherwise irritating secretions, I was skeptical regarding the family origin of this particular case. On inquiry I found that my patient had had a peculiar experience.

He had been troubled by a stricture for some time, and had noticed that it would take him qnite a while to make water; his wife, he said, often asked him why he took such a long time to urinate. He had performed his sexual functions in a most perfunctory manner. There was no inducement to excessive sexual indulgence at home, but he happened to run across a former mistress (a married woman), and had intercourse with her several times. Within forty-eight hours he developed an apparently typical case of virulent urethritis, with retention of urine. To make certain that the disease was not of the so-called specific character, I examined both his wife and mistress, and found them healthy so far as evidences of specific disease were concerned. The explanation of this case seems to be that the patient had become acclimated at home, and, there being no novelty in the situation, did not exert himself unduly, but on having sexual intercourse with his mistress he overdid himself and contracted a urethritis; the inflammation constituting this urethritis, superadded to the condition already existing, closed the stricture completely. Cases of this kind are by no means novel to the practitioner, and are conclusive evidence that the condition of the urethra has much to do with the causation of urethritis. Very simple causes, in combination with pre-existing morbid conditions of the canal, may produce acute and severe inflammation. When, therefore, a patient claims to have contracted a urethritis

independently of contagion, we are often justified in giving him—or the woman—the benefit of the doubt, and when the inflammation has decreased we must seek for organic changes in the canal.

It is said by some that there are undoubted cases of rheumatic urethritis; that patients of a rheumatic or gouty diathesis develop simple urethritis from exposure, independently of intercourse. I do not believe, however, that, if a urethra is healthy at the time of the contraction of a cold, a person is apt to have urethritis, no matter how rheumatic he may be. Exposure to cold and wet, and excesses in eating, drinking, and sexual intercourse, on the part of a person of gouty or rheumatic constitution, are often responsible for urethritis, but usually only when the canal is unhealthy from previous attacks of inflammation.

A case is reported by Dr. J. William White, of Philadelphia, whose keenness of observation is not open to question, which he believes to have been one of undoubted rheumatic urethritis:

A sailor, who had had no opportunities for sexual intercourse for a prolonged period of time, became intoxicated before arriving in port. On landing he sat down upon some stones, which came in contact with his testicles and perineum, and fell asleep. As a consequence, within a day or two a sharp attack of apparently virulent urethritis developed, which ran a most violent course.

I once observed a case in which an extremely gouty patient contracted a severe urethritis, followed by arthritis of the phalangeal articulations of one hand, resulting in Dupuytren's contraction. I had been treating this gentleman for lithæmia and urethral and vesical irritation for some months. He had been having intercourse with but one person, a married woman, whom I examined and found to be one of the cleanest and healthiest women I had ever inspected. The husband of this woman was perfectly healthy, as I had occasion to know. Should a similar case again come under my observation, an examination for gonococci will of course be made. The notes of this case were taken before the gonococcus had assumed a prominent place in pathology.

Cases of traumatic urethritis, generally due to rough instrumentation, are by no means rare. In almost every case of chronic gleet or stricture, unless careful in introducing instruments, we are liable to set up a urethritis from the traumatism produced by the exploration. This should be borne in mind, else we may sometimes erroneously suspect that our patient has a fresh attack of urethritis from infection, either personal or instrumental. It is, of course, to be remembered that traumatism may act by lighting up latent infection.

Syphilis sometimes gives rise to urethral discharges that may be mistaken for the ordinary form of urethritis. This is due to the development of a

tubercular syphilide or mucous patch upon the mucous membrane of the urethra, the lesions being the same as those developed in the mouth. Chancre or chancroid developing in the canal will also produce inflammation.

The lesions of syphilis are due to the accumulation of hyperplastic material within the meshes of the healthy tissue, such accumulations presenting characteristics varying with the location. When a syphilitic tubercle, papule, macule, small ulceration, or mucous patch occurs in the urethra, urethritis develops. The occurrence of syphilis of the mucous membrane of the urethra was responsible for the famous error of John Hunter, in his experiments upon himself with the virus of an apparent gonorrhœa. Inasmuch as a chancre, followed by secondary syphilis, developed from an inoculation of urethral discharge upon his arm, this eminent surgeon formed the erroneous conclusion that syphilis and gonorrhœa were identical. The fallacy of this opinion we now know to have been due to the unrecognized existence of urethral syphilis with the coincident urethritis.

With regard to the relation of urethritis to constitutional syphilis, there are those at the present day who are suspicious of their correlation. Preposterous as this may seem, there are clinical reasons therefor. Cases of syphilis are not infrequently seen in which there has been no primary sore discoverable, and the disease has apparently followed a urethritis. Those

who claim that syphilis can begin by urethral inflammation must show: (1) That no distinct syphilitic lesion (chancre) existed in any portion of the canal. (2) That the urethritis is not a coincidence. (3) That a chancre did not appear and disappear within a very short period of time, and thus escape detection. (4) That they have not only made a daily critical examination of the genitals, but that they are sufficiently expert to diagnosticate those insignificant primary lesions of syphilis which are sometimes seen. (5) That the primary focus of infection was not in some locality remote from the genital organs.

The principal point which it is desirable to impress in regard to the causation of urethritis is this: That any irritating discharge, leucorrhœal or menstrual, from the uterus or vagina, especially when combined with uncleanliness, may produce the disease. A severe cervical endometritis, which really lies at the bottom of most cases of leucorrhœa, is very apt to produce it. The acridity of the discharge in such cases may be readily demonstrated by an inspection of the excoriated os. Unless the surgeon remembers this particular point, he is apt to make frequent and lamentable mistakes, and may find himself brought into disagreeable prominence in the divorce court. The fact that a woman is not affected by vaginitis does not prove that she is incapable of communicating urethritis; for, however acrid the secretion from the uterus may be, it is not apt to cause vaginitis, the

mucous membrane lining the vagina being very tough and resisting, especially as compared with the delicate mucous membrane lining the male urethra. It may be assumed, therefore, that a discharge which will be tolerated by the female vagina may produce quite a sharp urethritis in the male. There is a source of fallacy, it is true, in determining the dependence of urethritis upon simple cervical catarrh, for in some women, as already remarked, virulent vaginitis may result in a chronic infectious inflammation high up, in and about the neck of the uterus, at which point there is a tendency to localization on account of the abundance of glands and the numerous crypts in the cervical mucous membrane. The vaginal vault, or at least that portion behind the neck of the womb, forms a sort of pocket in which chronic inflammation may localize itself and persist after the remainder of the mucous membrane has become comparatively healthy. In a case of this kind the trouble would not be apt to be discovered, excepting upon a most careful examination. In this nest of infection, protected from air and light, bacteria can go on developing until they become so virulent that by-and-by almost every individual having intercourse with the woman is affected by typically virulent urethritis; yet virulent vaginitis does not develop.

Apparently healthy people, through excessive sexual indulgence, may set up a sharp attack of urethritis or vaginitis. I remember an instance in illustration:

A man and woman consulted me, one after the other, and each accused the other of having communicated the gonorrhœa. Each claimed to have been perfectly healthy before intercourse. On investigation I found that, after a very hearty supper and a good deal of champagne, they retired and indulged in intercourse five or six times during the night, the man taking an injection in the morning to prevent himself from having a gonorrhœa. The result was that both had an apparently typical case of the disease. The probabilities are that neither of these patients had the disease in a palpable form prior to their excessive sexual indulgence. The woman may not have been especially cleanly, and probably had leucorrhœa. As a result of excessive eating and drinking, together with immoderate sexual intercourse, an inflammation was set up in each of the participants, the case of the man being precipitated to a certain extent by the irritant prophylactic injection.

Cases of this kind, I am well aware, are almost invariably pronounced attacks of specific inflammation, but I do not admit the specificity as proved. Most readers of the literature of the subject are familiar with Ricord's famous formula for catching the clap. It runs something like this: "Take a blonde woman with a leucorrhœa, the more leucorrhœa the better; wine her and dine her, have intercourse with her five or six times during the night, and take a prophylactic injection in the morning, and in a few days a beautiful clap will develop."

It must be admitted that in such cases as that which I have related, a latent gonorrhœa may exist in either party, with a resulting lighting-up of, and reinfection by, the infectious process in the one, and a primary infection in the other. *It is by no means impossible that during sexual excitement an infectious salpingitis may furnish the source of infection to both the woman herself and her male friend.*

The most important factor in a large proportion of cases of simple urethritis is the existence of granular or congested patches, or stricture, in the urethra of the male. An individual affected in this manner is likely to have urethritis after every act of intercourse; the more uncleanly the woman, the greater the liability to its development. So sensitive is the urethra in such instances that even a moderate degree of sexual excitement is sufficient to bring about inflammation. I have known urethritis to develop under such circumstances as a consequence of a glass or two of wine, and in other instances from too active exercise.

It is claimed that the normal menstrual secretion is very liable to excite inflammation in the male urethra. I am somewhat skeptical as to the potency of normal menstrual fluid in this respect. When, however, it becomes mixed with the decomposing discharges from uterine or vaginal inflammation, or putrid semen, or even in some instances if allowed to remain until it decomposes—independently of admixture with other secretions,—it may produce urethritis.

It seems to me probable that much depends upon the constitutional condition of the woman. Even in the absence of local disease, certain mental emotions and various constitutional conditions—particularly those that produce perversions in the quality of the blood and disturbances of the nervous system—may logically be expected to modify in some instances the menstrual secretion; whether such modification consists in the acquirement of excessive acridity by the menstrual fluid, or in a change in its quality favorable to decomposition, it would be difficult to say. There is one point upon which the author begs leave to be dogmatic, viz.: Normal menstrual fluid is perfectly unirritating and never excites urethritis.

The possibility of the dependence of the poison of gonorrhœa, to a greater or less degree, upon certain conditions of the nervous system, is not so remote as might at first sight be supposed. Certain mental emotions, such as fright, anger, and grief, probably have a most powerful effect upon the composition of certain normal fluids of the body, such as the milk, saliva, and gastro-intestinal secretions. *Is it not possible that, through certain impressions (not necessarily mental, but perhaps organic in character) made upon the sympathetic nervous system — which presides over the function of nutrition—certain chemical principles may be developed in the secretions of the uterus and vagina, which are either irritating per se or favor to a marked extent decomposition in these fluids?* Disturbances of

the nervous system are probably responsible for the phenomena of fever and incidentally for the production of various toxic compounds in the tissues through perverted tissue metabolism; and why may not such a perversion of metabolism result in a vitiation of the normal secretions of the genito-urinary tract? To carry the relation of constitutional conditions to the development of poison-bearing or decomposition-favoring secretions a little further, I will call attention to the influence of cachexiæ upon the healing of wounds and injuries of various kinds. Patients who are debilitated, strumous, or suffering from the various cachexiæ, are particularly liable to the development of septic processes as a consequence of wounds, either accidental or surgical. This fact is not only dependent upon a depreciated vitality or resisting power, but there appears to be in such individuals a peculiar tendency to decomposition on the part of the secretions of wounds. This is the first thing the surgeon appreciates when he is confronted with the necessity of operating upon a patient of depraved or cachectic constitution. Why may not constitutional depravity bear a similar relation to the development of toxic products of decomposition in the secretions of the female sexual apparatus? These considerations, involving the spontaneous production of poisonous materials in the vagina of the female, are not pertinent as applied to the male, for the reason that the male urethra, although a very delicate mucous mem-

brane and well supplied with mucous glands, and even more perfectly protected from air and light than is the vagina, is regularly flushed out by the passage of a fluid which is well adapted for cleansing purposes in this situation. Were it not for this fact, the female would by no means enjoy a monopoly of the spontaneous generation of the toxic principles of local venereal diseases.

If we base our views of the origin of these diseases upon the evolutionary theory of germ development, it is at once obvious that such circumstances as those just mentioned may have borne a very important relation to the primal development of the special poison or germ of chancroid or gonorrhœa at a very early period in the history of the human race.

As regards the contagiousness of menstrual fluid, it must be remembered that in women who are apparently free from disease the menstrual flow may bring down, and become mixed with, the products of a latent infectious process in the higher and less accessible portions of the genital tract.

The same considerations of constitutional states, in their influence upon the spontaneous development of the poisons of the local venereal diseases, apply with equal pertinency to the effects of these poisons when inoculated upon a healthy surface. For example, it is evident that if, as a consequence of certain influences, the poison has been elaborated and transferred to another individual, it will produce effects of

a varying grade of severity, the constitutional as well as the local condition having much to do in modifying the severity of the disease. It is obvious that a strumous or cachectic individual will have a primarily more severe attack of gonorrhœa or chancroid than will some other individuals from infection with the same virus. This is borne out clinically as a matter of every-day experience. The same may be said of women who have local gynic disease, or men who have highly irritable mucous membranes.

A point worthy of attention is the peculiar tendency to suppuration exhibited by some individuals. This is especially noticeable in the study of chancroid. Mr. Jordan Lloyd has termed such persons "suppurators." Other things being equal, the suppurator is more likely than others to have a virulent form of inflammation from the same intensity of infection. Individuals of this sort, when they contract a simple urethritis, are very apt to develop a violent inflammation, with profuse purulent discharge from comparatively slight causes of irritation. This peculiar tendency, then, often forms a connecting link between simple and virulent forms of urethral inflammation—perhaps independently of the susceptibility of the mucous membrane to bacterial or chemical infection.

Another phase of idiosyncrasy which deserves a certain amount of consideration is the tendency of certain individuals to catarrhal states of the mucous membranes; this is especially important as a factor in the causation of gleet.

SYMPTOMS OF SIMPLE URETHRITIS.

The symptoms of mild or simple urethritis consist of a slight or moderate urethral discharge of a muco-purulent character, with perhaps smarting on urination. This discharge comes on, as a rule, shortly after venereal excesses or intemperance in gouty or rheumatic patients with damaged urethræ, or in individuals suffering from stricture with granular congested patches in the urethra independently of any special diathesis. It may occur in individuals with sensitive but healthy urethræ who have had intercourse with somewhat uncleanly women. In such cases the urethra is inoculated with poisons or irritating materials that have not yet become elaborated through evolutionary progression into a form sufficiently acrid or virulent to produce so-called specific urethritis. These cases may, and very often do, merge into the virulent form as a consequence of dissipation, sexual excesses or ungratified desire, strong injections, over-exercise, or exposure. Attention to genito-urinary hygiene, restriction of diet, and administration of alkaline remedies, usually suffice to effect a cure. In the form dependent upon chronic changes in the canal, such as stricture or congested and granular patches in the mucous membrane, the relief of the immediate symptoms does not constitute our full duty in the premises, for as soon as the urethritis subsides it is necessary to dilate or cut strictures and (by various means, to be considered later on) to cure the diseased

patches in the canal. As long as these conditions exist, the patient will be likely to have urethritis as a consequence of the slightest indiscretion, and sooner or later a gleety discharge will develop independently of exciting causes. This form of urethritis has been described by Van Buren and Keyes and others as "bastard clap."

A most important and practical point in connection with this form of simple urethritis is this: Whenever a patient has a history of severe urethritis, and complains of urethral discharge recurring frequently from trivial causes, we are justified in suspecting chronic pathological changes in the mucous membrane which require careful attention. If simple dietetic and hygienic management does not suffice for the cure of the mild forms of urethritis, an injection will be necessary, and perhaps the internal administration of balsamic preparations. No form of astringent will answer for an injection in all cases, but I have found very mild solutions of the bichloride of mercury to act better, on the average, than anything else. Indeed, the bichloride acts better in these simple forms of inflammation than in the typically virulent form—rather a singular fact, if it be true that virulent urethritis is under all circumstances a specific germ disease. I have had excellent results from the use of the bichloride injections in cases of urethritis due to the passage of sounds in sensitive but previously healthy urethræ.

VIRULENT URETHRITIS.

Virulent urethritis results from: (1) Inoculation with the products of evolutionary germ changes which occur in the female vagina, after they have attained their acme of virulency. The trend of evidence is in favor of the gonococcus being the most frequent factor in this germ infection. (2) From inoculation with the products of a virulent vaginitis—which are derived from the same evolutionary changes—through the medium of the male, as the woman does not give herself virulent vaginitis, her membranes becoming inured to the gradual development of poisonous materials. (3) From an aggravation of pre-existing simple urethritis, whether of venereal or non-venereal origin, as a consequence of causes already enumerated. (4) From intercourse with a woman in whose vagina the products of virulent urethritis have been deposited a short time before by some man suffering from that affection.

It necessarily follows from a survey of these methods of infection that the disease is most usually contracted from impure intercourse. There is said to be a definite period of incubation of from three or four days to two weeks, but in the majority of instances it will be found that the disease comes on within two to four days after intercourse; on an average, perhaps, three days. This is subject to considerable variation, but if we exclude those cases in which the disease is primarily simple, but becomes

virulent as a consequence of various influences independent of contagion, it will be found that the disease comes on in the shortest possible time after infection. There is no constancy as regards the time, and I am inclined to think that there is no period of incubation at all. Some cases will develop within a few hours after exposure. The rapidity of the development is dependent entirely upon the susceptibility of the individual, the resisting power or toughness of the urethra, the degree of virulency of the product with which the inoculation is made, and the degree of sexual excitement or excess, as the case may be, which prevailed at the time of exposure. The disease comes on just as soon as could be expected from the inoculation of any organic poison of similarly irritating properties; in all probability it begins as soon as it has penetrated the mucous membrane, but this requires a little time, and following this a certain period of time is necessary before reaction occurs. Again, there is a gradual extension of the infection, and it is obvious that definite symptoms would not be apt to occur until a moderate amount of the mucous membrane had become involved. I am inclined to be explicit upon this point, chiefly because one of the principal arguments advanced in favor of the invariably specific character of the virus of gonorrhœa has been a comparison of the incubation period in virulent and in simple cases. It has been said that the cases coming on within a few hours after exposure are usually

simple, although it is admitted that these simple attacks may come on at any time within a week or two. It must be remembered in this connection: (1) That quite a proportion of the cases of simple urethritis are not dependent upon infection with any particular poison, but are due to aggravation of existing chronic conditions of inflammation. (2) That cases of simple urethritis which are dependent upon the deposition of irritating materials would necessarily vary as to the period of the appearance, according to the degree of elaboration of the *materies morbi* and the susceptibility of the urethra. (3) That the majority of individuals affected with virulent urethritis are those with virgin urethræ, in which there are no facilities for the speedy development of discharge, as contrasted with the simple cases of urethritis dependent upon chronic pathological changes in the urethra. (4) That patients with a damaged canal, who contract virulent urethritis, usually develop a simple urethritis speedily after intercourse, which subsequently becomes virulent. (5) That primarily virulent urethritis is due to inoculation with a poison which has become highly elaborated and has acquired a relatively high degree of activity; and this would explain the tolerably definite period of quiescence following inoculation quite as satisfactorily as would the so-called quality of specificity—in other words, the more highly elaborated the poison, the more uniform are its effects.

M. Leon le Fort, in an investigation of over two thousand cases of gonorrhœa, found that 50 developed within twenty-four hours, 778 within four days, 869 between the fourth and the eighth day, 276 from the eighth to the twelfth day, 112 from the twelfth to the sixteenth day, 17 from the sixteenth to the twentieth day.

Admitting that these statistics are correct, it seems to me that they effectually settle the question as to a definite period of incubation in urethritis.

It is, of course, admitted that microscopical examination of the discharge was not made by Le Fort, but from examination of his statistics one would not be led to expect the microscope to lend much aid in establishing a definite period of incubation.

SYMPTOMS OF VIRULENT URETHRITIS.

The symptoms of virulent urethritis are at once pronounced and characteristic. At the end of the so-called period of incubation the patient experiences more or less itching at the meatus, with smarting on urination, and on examining himself he finds the meatus is glued together with a clear, sticky deposit of mucus; during the next day an increased discharge is observed, accompanied with considerable heat and painful micturition. These symptoms gradually increase until about the fifth to the seventh day, at which time the disease reaches its maximum degree of severity. The inflammation now becomes station-

ary, the discharge at this time being thick, creamy, and of a greenish color, due to its admixture with degenerated blood-corpuscles. In some instances distinct hæmorrhage occurs; hæmorrhages from capillary rupture are by no means infrequent. The more virulent the case, the more greenish and profuse the pus, and the greater the liability to distinct hæmorrhages. In some virulent cases, however, there is such a high degree of inflammation that the discharge is merely a thin, greasy, muco-sanious fluid, but as soon as the process begins to subside somewhat the discharge becomes thick, creamy, and purulent, but still of a greenish cast. It is during the stationary period of the disease that the patient is most apt to have chordee; this consists of a painful bending of the penis during erection, and is due to interstitial inflammation of, and plastic exudate into, the corpus spongiosum and the submucous connective tissue surrounding the urethra. The penis, it will be remembered, is composed of three segments, of which the two superior (the corpora cavernosa) are the main factors in erection. When the organ is erect, the inflamed, infiltrated and inelastic corpus spongiosum acts upon the body of the penis like the string of a bow and causes it to bend. The corpus spongiosum being highly sensitive, severe pain results from its own resistance to erection.

There is a popular opinion to the effect that breaking the chordee will cure the urethritis. This

has probably arisen from the fact that more or less benefit has been noticed from the depletion resulting from this accident, and also probably because the rupture has occurred at a time when the disease should naturally have begun to subside. As a consequence of this popular impression, certain laymen, who are fond of exhibiting their alleged knowledge of medicine and surgery—particularly with reference to venereal diseases—frequently advise their friends to have intercourse during the existence of a chordee, or to otherwise attempt its rupture. The patient should be warned against this pernicious practice, and thoroughly impressed with the fact that such a course will result in all probability in severe hæmorrhage, and inevitably in the worst form of organic stricture. Even when the mucous membrane alone is infiltrated, it becomes less elastic; consequently when erection occurs even without chordee, the patient experiences considerable pain. During erections slight traumatisms of the mucous membrane may occur, which subsequently become the points of departure for organic stricture. The author has elsewhere called especial attention to this point.* It is an unfortunate circumstance that any disease or injury affecting the penis or urethra irritates, as well as increases the heat of, the parts, and, as a result of reflex action, produces frequent and violent erections.

**Vide* my monograph on "Stricture of the Urethra," 1893.

During the time the disease is at its height, there may be general constitutional disturbance, a severe urethritis often giving rise to considerable fever; pain and heat about the parts, a sense of dragging along the spermatic cord, neuralgic pain in the testicles, and a backache resembling lumbago, are very frequently observed.

After remaining stationary for perhaps six or seven days, the inflammation begins to decline, all of the symptoms decreasing in intensity. In the majority of carefully treated cases the patient is apt to get along very nicely, the discharge ceasing in from three to six weeks, with the result of complete recovery. Unfortunately, however, in quite a proportion of cases there is a tendency to chronicity in spite of the best of treatment; the discharge under such circumstances becomes thinner and more watery, and persists for an indefinite period. This condition—or rather symptom —is termed a gleet.

CHAPTER III.

CHRONIC URETHRITIS.

Chronic urethritis embraces all those various phases of secretion-forming inflammations of the urethra which are generally included under the generic term of Gleet. For the sake of accuracy, the latter term—if it be used at all—should be applied only to those chronic forms of inflammation which come on at a greater or less interval after the acute urethritis is apparently cured, as a consequence of various pathological changes of a chronic character, due to the antecedent acute inflammation. It is better, however, to use the term first suggested.

CAUSES OF CHRONIC URETHRITIS.

The causes of chronic urethritis are as follows:

1. Idiosyncrasy. This consists in this instance of a predisposition to mucous fluxes and catarrhs, and is a particularly important factor in certain climates; the variable temperature and barometric pressure of our lake region have seemed to me to have an influence in aggravating and perpetuating urethritis.

2. The gouty and rheumatic diatheses.

3. Dyscrasiæ of various kinds, particularly syphilis.

4. Cachectic conditions resulting from constitutional disease of an acute or chronic character.

5. Intemperance in eating and drinking.

6. Improper treatment, involving usually the use of too powerful injections, with resultant destruction of the epithelium of the mucous membrane.

7. Too active exercise during the acute stage of urethritis.

8. Prolonged and ungratified sexual desire.

9. Sexual excesses and masturbation.

10. Privations of various kinds and unhealthy hygienic surroundings.

11. Localization of the acute inflammation at some particular point, with a consequent patch of local disease involving stricture or a granular and congested condition of the mucous membrane. This is the most important factor of all.

It will be observed from a survey of these various causes that the influences which tend to the perpetuation of urethritis are numerous and varied.

VARIETIES OF CHRONIC URETHRITIS.

Chronic urethritis presents itself in three different forms:

1. The acute inflammation subsides to a certain extent, but remains subacute with occasional acute exacerbations and thick, purulent discharge for an indefinite period. In this form of chronic inflammation there is continual discomfort, with more or less pain and smarting on urination. Generally, too, the prostate is involved to a certain extent, giving rise to a feeling of fullness and tension of the perineum, with frequent urination.

2. The discharge becomes thin and watery, being sometimes so scanty that nothing is visible save a drop or two of muco-purulent fluid escaping from the meatus in the morning. This is the most frequent form of the disease, and is not usually attended by discomfort. It may depend upon: (*a*) a simple catarrhal condition of the mucous membrane, such cases involving the element of constitutional and local predisposition; (*b*) congested and granular patches in the mucous membrane; (*c*) organic stricture; (*d*) urethral polypi—this is a very rare condition, but cases in which polypoid growths were removed *via* the endoscope are reported by Grünfeld and others; (*e*) abscesses or fistulæ resulting from acute urethritis, and becoming chronic; (*f*) dilatation and pocketing, with chronic inflammation of the lacuna magna; (*g*) prostatic catarrh; (*h*) posterior urethritis; (*i*) folliculitis; (*j*) cowperitis; (*k*) tubercular infection.

3. In this form of chronic urethritis the inflammation is apparently recovered from, but after a variable period of time, during which the individual does not have his attention called to his urethra, there develops, as a consequence of sexual excesses, intemperance, or the like, a thin muco-purulent discharge.

The distinctive features of the various phases of chronic urethritis are dependent upon differences in the degree of activity of the inflammatory process; such differences do not warrant a distinct differentiation of chronic urethritis and gleet. As a rule, how-

ever, the danger of contagion is directly proportionate to the degree of purulency of the discharge. It must be considered in this connection that, as already suggested, it is possible that the discharge of virulent urethritis may lose its purulent and ordinarily infectious qualities as far as its capacity for imparting acute vaginitis is concerned, but may nevertheless become transformed in such a manner that it is still capable of setting up various uterine, peri-uterine, salpingian, and ovarian troubles in the female.

Some of the cases of so-called gleet consist in the appearance, under sexual excitement, or almost uniformly on rising in the morning, of a slight sticky moisture at the meatus. In most of these cases the annoyance produced by the disease is entirely of a mental character. I am often inclined to think that such patients would experience a feeling of disappointment if they failed to detect on rising in the morning the usual tear of urethral secretion. The appellation of *mental gleet*, although a little far-fetched, would not be inappropriate as applied to such cases. Some of these patients are unable to detect the secretion except on squeezing the urethra. It is very amusing to observe the pertinacity with which such individuals will vigorously "milk" the urethra for the purpose of exhibiting a drop or two of mucus as an evidence of their alleged deplorable condition. I dare say that 50 per cent. of these cases are kept up by this little performance. Most indi-

viduals, upon being questioned, will acknowledge that they are in the habit of seeking for the discharge a number of times daily, and they are considerably surprised when informed that their enthusiastic search for something they do not wish to find is responsible for their woes. The pathological condition in this variety of gleet is simple hypersecretion of mucus by the follicles of the urethra. I am convinced, moreover, that quite a proportion of cases in which the discharge is more pronounced are dependent upon a catarrhal state of the mucous membrane, with a coincident hypersecretion of mucus, as a result (1) of habitual over-stimulation of the glands, and (2) of their enlargement.

The discharge in most cases of gleet is thin, rather watery, and of a whitish color. It becomes thicker and yellower, however, under the influence of the various causes enumerated as productive of chronic urethritis. A patient with the gleet is continually liable to acute exacerbations of his urethral difficulty upon the occurrence of the slightest exciting cause. The origin of the discharge, in cases in which no local lesion of the urethral mucous membrane is evident or can be discovered, is the numerous mucous follicles lining that portion of the urethra corresponding to the site of the chronic inflammation. In some instances there is doubtless more or less prostatic secretion mingled with the urethral discharge, this being dependent upon congestion of the prostate and

hypersecretion of its follicles. There is more or less epithelium mingled with the discharge in these cases, and it will be found that one of the characteristic features of gleet is a rapid formation and removal of the delicate epithelial cells lining the urethra. This is particularly the case in chronic urethral inflammation dependent upon chemical or traumatic interference with the canal, such as is afforded by strong injections and by instrumentation. When congested, granular, or abraded patches exist in the course of the canal, there is a constant hypersecretion of mucus or muco-pus, with exfoliation of the epithelium upon the surface of the lesion. In this condition, as well as in stricture, the current of urine, as it passes over the diseased portion of the canal, rolls up into strings or threads the desquamated epithelium and muco-purulent deposit upon the surface of the diseased membrane. These strings appear in the urine as the delicate thready filaments—*tripper faden*—which, as every practical surgeon is well aware, are almost invariably indicative of urethral disease. The majority of surgeons invariably attribute this appearance of the urine to stricture, but this is a mistake, for it will be found in many cases in which stricture cannot be detected, and is in such cases dependent upon urethral catarrh and general desquamation of epithelium. In stricture a condition of chronic inflammation exists posterior to the narrowing of the canal; as a consequence of obstruction at this point, there is

more or less pouching or bellying of the urethra at the posterior surface of the stricture. This dilated portion of the canal loses its elasticity and contractility, and, as a consequence, forms a more or less passive pouch upon its floor, wherein a drop or two of urine almost invariably remains and decomposes. As a result of this decomposition, the inflammation and consequent muco-purulent secretion are enhanced. It is from this point that the gleety discharge and thready urinary filaments characterizing stricture are derived.

I desire to emphasize particularly the influence of powerful injections in the production of chronic urethritis. I have had a number of cases come under my observation in which the patients had used powerful solutions of carbolic acid, sulphate of zinc, permanganate of potash, etc., in the early stages of urethritis, and in the majority of these cases I have had an endless amount of trouble in curing the disease. I have become convinced that the obstinacy of such cases is dependent upon chemical destruction of the epithelium lining the canal. This, being repeated from day to day, eventually results in a permanently abraded condition of the entire mucous membrane, which necessitates the rapid proliferation of epithelium for the purpose of repair; this epithelium, however, being of a low grade and moreover governed to a certain extent by the influence of physiological habit, is thrown off as rapidly as formed, and

as a result the canal remains in a perpetually raw and inflamed condition. It is by no means necessary that injections should be acutely painful when used, to accomplish this untoward result.

Still more important factors in the production of gleet are intemperance and imperfect sexual hygiene. The use of alcohol predisposes all the tissues of the body to inflammatory processes, particularly the mucous membranes, which become highly irritable; it has, moreover, a special effect in over-stimulating the sexual apparatus, both through the medium of the nervous system and more directly through producing irritating properties in the urine. The majority of those who contract urethritis are chiefly concerned about the interruption of their customary fornication; they also entertain the fatuitous idea that any form of sexual stimulation short of actual intercourse is not injurious—so they associate intimately with women of loose character, whom they can caress and take liberties with, and, as a result, keep the sexual system in a constant state of excitement. This is fully as disastrous in its effects as natural sexual indulgence, if, indeed, it is not worse. As soon as our patients are satisfied that a discharge no longer exists, or, in many instances, as soon as the discharge has greatly diminished in quantity, they begin their sexual indulgences. They come to us in the fault-finding manner of the average venereal patient, and ascribe the unfavorable progress of the urethritis to improper treatment;

seldom will they acknowledge sexual excitement of indulgence, or the imbibition of alcoholics. Were it not for the sexual and alcoholic elements in the production of gleet, I am satisfied that comparatively few cases of urethritis would last over six to eight weeks.

Lack of rest is another important element favoring chronic urethritis. In every case of virulent inflammation in which the patient is so situated that he is compelled to be on his feet a greater part of the time, to walk about or engage in muscular strains, lifting, etc., we may expect a stubborn course of the disease. As a corollary, it is to be inferred that patients having facilities for comparative quiet will recover quite promptly in the majority of instances.

DURATION OF CHRONIC URETHRITIS.

The duration of chronic urethritis is very uncertain; it depends mainly upon the curability of the various pathological conditions of the canal to which the perpetuation of the chronic urethral inflammation is due. In some instances a cure is impossible, judging by the frequency with which cases are encountered that have undergone every known method of treatment for a number of years without success. I venture the opinion that catarrhal urethritis is more apt to persist indefinitely in such an environment as our lake region than it is in other localities.

Some cases of gleet cannot be cured, simply because of the pertinacity with which the patient clings

to the belief that he is in a serious condition, over-treatment being the most natural result. I meet with numerous cases in which I consider the patient to be practically cured, but find it impossible to convince him that such is the case. These cases of psychopathic gleet go from surgeon to surgeon, vainly seeking a cure for something which does not exist.

Too prolonged and energetic treatment is often responsible for the perpetuation of gleet. Many cases are observed in which improvement occurs only upon complete cessation of treatment.

Cases of gleet are occasionally seen that defy all measures of treatment. Although trite, the expression of Ricord with regard to the obstinacy of gleet is decidedly pat. This famous specialist once said that he dreamed he was dead and had been sent to Purgatory. Upon being asked what sort of a place it was, he replied that it would have been pleasant enough if it had not been for the fact that whole troops of male spectres stalked about him, each pointing its ghastly finger at him and exclaiming: "Ricord! Ricord! you could not cure my gleet!"

Many cases of gleet remain uncured because the lesion is not localized and treated. Posterior urethritis is especially apt to be undetected.

CHAPTER IV.

MORBID ANATOMY OF URETHRITIS.

The infection in urethritis is generally supposed to begin at the meatus. Milton has remarked the apparent contradiction of chancre and chancroid in the urethra as regards the site of inoculation, and states his belief that in such cases the virus is deposited at the lips, and subsequently diffuses itself until it meets with a susceptible portion of mucous membrane. It is certainly open to question whether morbid secretions can be drawn into the urethra during sexual connection; it seems plausible to me, however, that a certain amount of aspiration is produced by the penis, quite capable of drawing secretions from the vagina into the urethra, the relation of the male and female organs being much like that of the piston and cylinder of an ordinary pump. The alternate contraction and relaxation of the deep urethral and perineal muscles must also, it seems to me, produce an aspirating effect upon the anterior urethra. Ledeganck's observations apparently support this view. He found, upon examination of the urethra through a thin cylindrical glass speculum, that the inflammation commenced, in the majority of cases, in the fossa navicularis.* After the inflammation has begun in the fossa

* Journal de Médecine, 1871.

navicularis, or at the meatus, the remainder of the mucous membrane, for a variable extent of the urethra, becomes infected by contiguity.

As far as I am able to judge of the observations of our best authorities, the extent of the urethra involved in urethritis is very variable. The inflammation is generally most severe in the anterior two or three inches of the canal, but may involve the mucous membrane as far back as the neck of the bladder.

An interesting case is related of extensive virulent urethritis which involved the deeper portion of the canal and proved fatal upon the sixth day, as a sequence of general pyæmic infection.*

Published opinions vary greatly as to the extent of the mucous membrane eventually involved in urethritis, but I am inclined to think that in the more marked or virulent cases the inflammation almost invariably extends backward until it reaches the bulbo-membranous junction. At this point it usually ceases, but it may from various causes extend still further, and even involve the mucous membrane of the bladder. This, however, is rare. Involvement of the deep urethra is much more frequent than was formerly supposed. In some of the slighter cases it is possible that only a moderate extent of the anterior portion of the canal is involved. In typically virulent

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*Charteris, British Medical Journal, 1876.

cases the inflammation gradually extends backwards until it attains its height—from the fifth to the eighth day—by which time it has reached the opening in the triangular ligament.

In the milder forms of urethritis the pathological changes consist in a few instances in slight hyperæmia with attendant reddening and hypersecretion of the mucous membrane. In the majority of instances, however, there will be found those chronic changes in the canal already alluded to in connection with the subject of gleet, so that the pathological anatomy of simple and chronic urethritis is, as a rule, essentially the same.

The localization of the inflammation, and the consequent production of stricture and abraded, granular, or congested patches, is due to several causes: (1) The most important is the relative inelasticity of the portions of the urethra involved; this produces friction during micturition, and tends to localize the inflammatory process at the points of imperfect dilatability; there is, in my opinion, no more important factor in the localization of stricture. (2) Dilatation and aggravated inflammation of a few mucous follicles at some particular point of the canal; this may result from obstruction of their lacunæ, or from the entrance into the follicles of irritating injections. (3) Injury of the canal at different points, due to the introduction of instruments; a long-nozzled urethral syringe is most frequently responsible for

congested and tender spots, stricture, and dilatation of the lacuna magna in the anterior portion of the canal. (4) The spontaneous or traumatic yielding of the corpus spongiosum at some particular point in the course of a chordee. (5) Slight thickening of the urethra, due to forgotten injuries of the mucous membrane and corpus spongiosum.

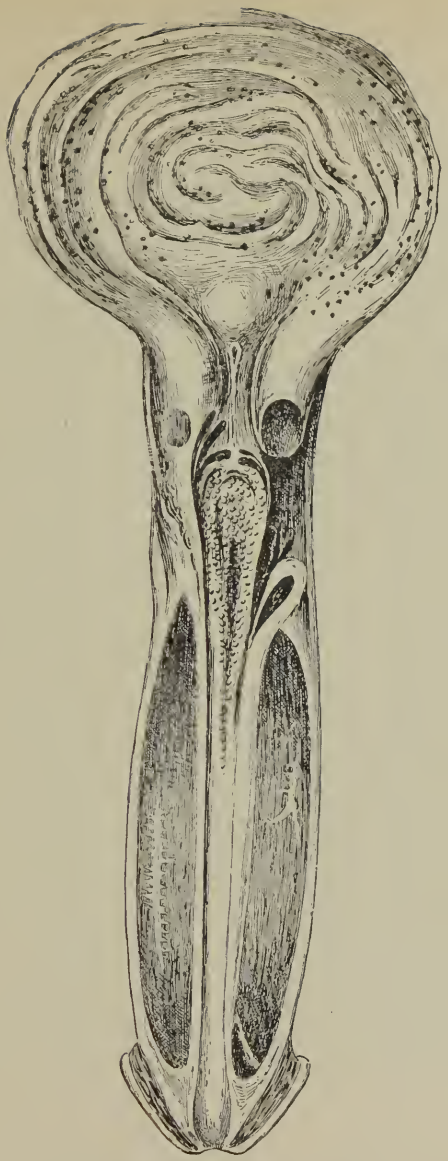
According to Ziessl, enlargement of the prostate is almost uniformly found in cases of long-continued gonorrhœa, particularly if the patient be addicted to masturbation or sexual excesses. This may persist and give rise to hypersecretion, prostatorrhœa, and prostatic gleet.

As far as the inflammation of the mucous membrane *per se* is concerned, the morbid changes in virulent urethritis differ from those of the simple forms only in degree. This is a necessary corollary of the view that one is but an intensification of the other, the milder being convertible into the virulent variety under the influence of certain special causes. The principal change consists of intense hyperæmia, with swelling of the mucous membrane. This is attended by a diminution in the calibre of the canal, which occasionally results in complete urinary retention (inflammatory or congestive stricture). When the inflammation is at its height, there will be found to be an infiltration of the corpus spongiosum with connective-tissue cells, resulting in a thickening and stiffening of that structure. Late in the history of the case this plastic infiltration

either disappears entirely or—not infrequently—localizes itself at certain points. These points are the posterior portion of the fossa navicularis, the lacuna magna, and the junction of the bulbous and membranous portions of the urethra. It is in these situations that we are most apt to have stricture, and it is here that congested and granular patches are often covered by fungous elevations; underlying them there is more or less thickening of the corpus spongiosum. This thickening or infiltration has a tendency to organize and contract, thus lessening the calibre of the canal and constituting stricture. The friction produced by the pressure of the stream of urine aggravates these localized morbid processes.

When the prostatic portion of the urethra is implicated, the prostate itself may be acutely congested or inflamed, thus giving rise to retention from mechanical obstruction. It is probable that there are few cases of gonorrhœa in which the prostate is not involved directly or reflexly. Retention of urine is not always due to inflammatory swelling, but sometimes occurs as a consequence of simple reflex spasm. It is the author's opinion that the glandular structures of the prostate are always involved in posterior urethritis.

The follicles of the urethra are found to be dilated and filled with purulent or muco-purulent secretion. Small herpetic excoriations are occasionally observed —probably in cases in which a predisposition to



Granular Urethritis. (After Finger.)

herpes exists, said predisposition consisting usually in local disturbance of innervation. In view of the extensive and violent inflammation characterizing some cases of virulent urethritis, it is rather singular that true ulceration of the urethra does not occur from the disease *per se*. It may result, however, in chemical or traumatic urethritis, and may form behind the obstruction in certain old cases of stricture.

In very severe cases of urethritis the bladder may become acutely involved from secondary mixed infection, the inflammation sometimes localizing itself about the so-called neck of the viscus, and in other cases involving the entire mucous membrane. As a rule, however, so-called gonorrhœal cystitis consists of acute follicular prostatitis, *i. e.* so-called posterior urethritis. In all cases in which the inflammation is of a high grade, the epithelium lining the canal will be found abraded here and there, and sometimes nearly entirely absent throughout the extent of the canal involved in the inflammation. Independently of infiltration of the spongy body, the mucous membrane is usually thickened and dense, and its surface presents numerous superficial erosions where the epithelium has been abraded—which is not unlike the appearance presented in balanitis. The pathological factors which are most important as explaining the persistency of certain cases of urethritis are: stricture, congested and granular patches, enlargement of the lacuna magna, dilatation and inflammation of the glands of

Littré and sinuses of Morgagni, and prostatic congestion, or follicular prostatitis, *i. e.* posterior urethritis. Associated with the morbid appearances of ordinary virulent urethritis we sometimes have certain special conditions, due to the various complications about to be mentioned.

CHAPTER V.

COMPLICATIONS OF URETHRITIS.

The principal complications of urethritis are: (1) Severe chordee; (2) hæmorrhage; (3) folliculitis; (4) peri-urethral phlegmon; (5) retention of urine from inflammatory or spasmodic stricture; (6) prostatitis; (7) cowperitis; (8) cystitis; (9) epididymitis and orchitis; (10) gonorrhœal rheumatism; (11) gonorrhœal ophthalmia; (12) gonorrhœal conjunctivitis; (13) bubo; (14) balanitis and balano-posthitis; (15) vegetations; (16) lymphangitis. Some of these are of sufficient importance to merit separate and exhaustive description, such as the scope of this work would hardly permit.

CHORDEE.

Severe chordee and distinct hæmorrhage are naturally associated, inasmuch as the latter depends upon rupture of the former. Chordee comes on after the inflammation reaches its maximum of intensity, plastic exudate being at this time most marked. It does not give rise to any inconvenience excepting during erection, when the pain is sometimes excruciating, the annoyance being most marked during the night. The penis during erection may bend like a bow, the convexity of which usually corresponds to the corpora cavernosa. In some instances, however, it bends in the other direction, or to one side, or is twisted. The

principal danger is of rupture and hæmorrhage, with subsequent severe organic stricture, or perhaps abscess. Severe pain may be experienced during erection without incurvation of the penis. As a consequence of spontaneous or traumatic rupture of the chordee, a varying degree of hæmorrhage may occur.

FOLLICULITIS.

Localized and severe inflammation of the mucous follicles of the urethra is liable to occur at any time during the progress of a gonorrhœa, particularly in the acute stage. The condition manifests itself in the form of small, tender, spherical or oval swellings, of varying size—from a small shot to a pea, or perhaps larger—along the floor of the canal, especially in its anterior portion. This condition is due to a stoppage of the sinuses of Morgagni, which results in the formation of retention-cysts containing pus and mucus. Very little pain is experienced, the complication being of a chronic or subacute character. As far as I have been able to observe, these follicular beads rarely lead to serious trouble, but usually discharge themselves into the urethra; Van Buren and Keyes are of the opinion, however, that they usually open externally, and very rarely into the urethra. I very frequently meet with them in my practice, and have found that they usually subside, apparently by discharging into the urethra or by resolution, and give rise to no inconvenience whatever, save a tendency to

chronicity of the urethral inflammation. I have noticed simultaneously with their appearance a decrease in the discharge; an increase, however, occurs from time to time, apparently dependent upon the occasional emptying of the contents of the dilated follicle into the urethra. In some instances the small tumors shrink down, become very hard, and persist for an indefinite period of time. The lacuna magna, when affected by localized inflammation, dilates, the flap of mucous membrane bounding it below becoming hyperplastic and redundant, thus forming quite a marked pocket, at the bottom of which chronic inflammation persists indefinitely. Such a condition is curable only by slitting the fold of mucous membrane on a fine director, thus converting the lacuna magna and fossa navicularis into one cavity. In very rare instances the dilated follicle ruptures both externally and internally, giving rise to suppurative inflammation, abscess, and penile or perineal fistula. Minute fistulæ near the meatus, perhaps opening just within its lips, are not infrequent results of folliculitis. I have observed several of this character.

PERI-URETHRAL PHLEGMON.

This is a frequent complication of urethritis. It consists of an inflammation of the cellular tissue surrounding the urethra, and is brought about in several ways:

1. As a consequence of a minute rupture of the mucous membrane, a small quantity of the products

of bacterial evolution or the bacteria themselves is extruded into the cellular tissue, and there sets up localized cellulitis.

2. An inflamed follicle ruptures into the cellular tissue, producing phlegmon in the same manner.

3. The poison is either conveyed to the cellular tissue by means of the lymphatics, or staphylococci or streptococci pyogenes migrate into the cellular tissues from the urethra—mixed infection.

4. Rupture and extravasation of the dilated and ulcerated urethra behind an organic stricture.

All of these inflammatory complications imply either extension by contiguity of structure via the mucous ducts, or an abrasion of epithelium with a resultant absorptive surface.

Phlegmonous inflammation is said to lead inevitably to suppuration, but numerous instances of localized subacute cellular inflammation occur which eventually resolve and do not lead to the formation of abscesses. I have seen in several instances a lump as large as a good-sized hickory nut disappear in this manner under the use of hot applications. The favorite seat of this complication is in the fossa navicularis, the most frequent site being the vicinity of the bulbomembranous portion of the canal. It may develop upon one or both sides of the frænum preputii, presenting in the latter event a peculiar bilobed appearance. When occurring in the deep urethra it is serious, and may lead to extensive perineal suppuration and

extravasation of urine. The principal dangers of the disease are: retention of urine, infiltration, extensive abscess, sloughing, and fistulæ. The loss of tissue in the anterior portion of the canal is a very serious matter, often leaving a condition resembling hypospadias. The abscess may rupture externally and no serious results occur, the opening (if such exists) between the abscess and the urethra having become occluded by inflammatory deposit; should, however, the collection of matter empty into the urethra, extravasation of urine is almost inevitable at the next act of micturition, with consequent external suppuration and fistula. The swelling caused by the phlegmon is œdematous, but circumscribed and comparatively painless at the beginning, becoming quite painful if suppuration occurs. I am satisfied that the liability to suppuration is exaggerated by most authorities, and that the treatment which they recommend is usually too radical.

RETENTION OF URINE.

Retention of urine occurring in gonorrhœa is essentially the same in its various phases as when arising from other causes, and does not require a detailed description at this point. It depends on inflammatory swelling of the mucous and submucous tissue in conjunction with deep muscular spasm. This is the so-called congestive or inflammatory stricture. It may be precipitated by sexual or dietetic indiscretions.

ACUTE PROSTATITIS.

Prostatitis is one of the occasional and severe complications of urethritis, and in my opinion is one which is often avoidable. I have rarely seen a case in which a directly exciting cause was not discoverable. It is exceptional, perhaps, that inflammation extends to the deep urethra without some special cause. Over-exertion, sexual excitement or indulgence, exposure, strong injections—or mild ones improperly used—and the passage of instruments, are among the more active causes of a complicating inflammation of the prostate in the course of an acute urethritis. Soluble bougies, recurrent irrigation, and the passage of catheters for the relief of retention, have caused a considerable proportion of cases. Instruments and injections act in two ways: (1) By causing a severe exacerbation of inflammation, with resulting extension to the deep urethra; (2) by carrying—or driving—the infection directly to the prostatic sinus. Some cases are doubtless due to secondary mixed infection. Most often the inflammation is follicular, less frequently it is diffuse.

Results.—In the diffuse form, resolution occurs in the larger proportion of cases within ten days or two weeks. Some cases go on for three or four weeks before subsidence begins. It is said that some begin to subside within three or four days; I confess I have not seen such. I can conceive of a simple prostatic congestion—which is very frequent in ure-

thritis—subsiding very speedily, but am rather skeptical regarding so favorable a result when once acute inflammation has supervened.

Abscess is a not infrequent result. The suppuration may be limited or more or less diffuse, the latter involving the peri-prostatic cellular tissue. When suppuration of the prostatic body is extensive, the cavity of the abscess may be trabeculated. With the evacuation of the abscess, resolution begins, and then goes on quite rapidly—much more rapidly, in my experience, than in non-suppurative cases.

The pus may burrow outside of the organ in the cellular tissue about the rectum, or may escape into the urethra; the escape of a few drops in the latter direction often heralds complete relief from the symptoms. The quantity of pus in a peri-prostatic abscess is sometimes surprising; in one case which I opened through the rectum there had been extensive burrowing and the formation of at least four ounces of pus. This case resulted from the faithful use of strong carbolic-acid injections, followed by soluble bougies, and the frequent use of the catheter to relieve retention.

The follicular form of acute prostatitis constitutes the so-called posterior urethritis, and almost invariably becomes chronic. Indeed, it is doubtful whether a prostate so affected ever recovers completely.

The inflammation, instead of resolving, may become chronic. As a rule, the chronic inflammation

is follicular and gives rise to prostatic catarrh—prostatorrhœa—or the various symptoms of posterior urethral inflammation. It may, however, be parenchymatous and simulate prostatic hypertrophy. The damage done by prostatic congestion and inflammation is often, I think, responsible for prostatic hypertrophy later in life.

Symptoms.—The first sensation is a desire for frequent micturition, associated, in diffuse cases, with a sensation of fullness and throbbing in the perineum, and perhaps in the rectum. Rectal tenesmus and an uncontrollable desire to defecate are occasionally experienced. Defecation may be excessively painful. These symptoms increase gradually in severity until, in those cases in which abscess forms, the patient undergoes considerable suffering.

As swelling goes on, retention may occur. The urine is apt to be mixed with blood, especially as the last few drops are expelled. At this time, as the perineal muscles squeeze the inflamed and sensitive organ, severe and cutting pain is experienced. This pain may be referred to the end of the penis. The glans may be bluish and congested. On examination per rectum the prostate is found to be enlarged, hot, and tender. Pressure upon the organ causes an urgent desire to urinate. As a rule, the enlargement is uniform and comparatively smooth in contour; occasionally it is more marked on one or the other side, or it may be irregular and lobulated in outline. When

abscess occurs, fluctuation may be felt per rectum—rarely through the perineum. In some cases the enlarged prostate completely fills the lower portion of the rectum.

All of the symptoms of acute prostatitis are aggravated by movement.

COWPERITIS.

Cowperitis is an inflammation of the glands of Cowper, which are located between the layers of the triangular ligament upon each side and behind the bulb of the spongy urethra. It is due to simple extension of the inflammation, and is rarely seen but as a complication of gonorrhœa. It has been ascribed, however, to careless instrumentation of the canal and excessive sexual intercourse, but these causes are effective only during the existence of urethral inflammation. As a rule the disease occurs only upon one side, there being apparently a predilection for the left. There is a moderate amount of cellular tissue about the gland which becomes involved, and it is to this rather than to the inflammation of the gland proper that the incidental perineal swelling is due. I have known cowperitis to occur spontaneously in a tuberculous patient.

Symptoms of Cowperitis.—The symptoms are pain, swelling, throbbing, and a feeling of tension in the perineum—at which point, if examined early, a small, sensitive tumor the size of a buckshot may be found.

Later on, the perineum upon one or both sides becomes swollen, hard, and brawny, and it is impossible to outline the structure primarily involved. The scrotum may become swollen, reddened, and œdematous. There is apt to be more or less constitutional disturbance incidental to the close confinement of the inflammatory exudate by the triangular ligament. If there be much cellular inflammation external to the ligament, suppuration invariably occurs, while in limited cases resolution may occur without it.

CYSTITIS.

True cystitis is not a frequent complication of urethritis. It may result from any of the causes mentioned in connection with prostatitis; occasionally it complicates the latter. Fortunately the inflammation in most cases of so-called cystitis is limited to the true vesical neck, *i.e.* the prostatic urethra. Many of the cases that we now term posterior urethritis formerly masqueraded as cystitis, inflammation of the vesical neck (implying inflammation of the lower segment of the bladder), neuralgia of the vesical neck, etc. Gonorrhœal cystitis is rarely if ever due to the gonococcus, but is a secondary mixed infection, pyogenic microbes bearing perhaps the most important relation to it.

Results.—The inflammation may become obstinately chronic and last throughout the rest of the patient's life. Extension to the ureters, renal pelvis,

and even the renal structure proper, may occur. Profound asthenia and the typhoid state, with dry, brown tongue, delirium, and fever, may occur in acute general cystitis. Sloughing of the vesical mucous membrane may result in some acute cases. In the chronic forms, ulceration, irritability, and contraction of the bladder may occur. Stone may form as a result of precipitation of the products of inflammation and the urinary salts.

Symptoms.—Frequent, painful, and perhaps bloody micturition is the characteristic symptom. Examination per rectum discloses tenderness of the vesical neck perhaps, but little or no prostatic engorgement, unless prostatitis coexists. Palpation over the hypogastrium detects extreme tenderness in severe general cases. Sometimes the tenderness is more obscure. In some cases there is tenderness pretty well diffused over the abdomen.

The symptoms are much milder where the outlet of the bladder is alone involved, and there may be no tenderness over the hypogastrium. In severe cases locomotion is uncomfortable. The constitutional symptoms vary with the severity of the case. More or less fever and great anxiety are quite characteristic symptoms in violently acute cases. Delirium may be noted. Few diseases are productive of so much mental disquiet as is acute cystitis. The urine is scanty, high-colored, and perhaps quite bloody; it contains albumen proportionate to the amount of pus and

blood present. When sloughing of the mucous membrane occurs, shreds of that structure are found. Clots may be formed and come away with the urine, their expulsion being marked by severe tenesmus.

EPIDIDYMITIS AND ORCHITIS.

Inflammation of the testicle is the most frequent complication of urethritis. Rarely does the inflammation affect the body of the testis alone, and rather exceptionally is there a marked degree of involvement, even when the epididymis is severely inflamed. More or less inflammation of the envelopes—at least of the body of the organ—is, however, usual in cases of epididymitis. Whether the gland structure proper is ever involved in gonorrhœal inflammation, is open to question.

The frequency with which epididymitis complicates urethritis is variously estimated at from 6 to 12 per cent. Fournier states that it occurs once in every eight or nine cases. It would be extremely difficult to estimate the exact percentage, as so much depends upon treatment and the conduct of the patient. I believe the majority of cases are due either to harsh treatment or to some indiscretion or over-exertion on the part of the patient. Strong injections —or mild ones carelessly used,—soluble bougies, rough manipulation of the canal (especially in irrigation), alcoholic and sexual indulgence, sexual excitement, and over-exertion, are entitled to great credit

in this direction. My experience in private practice has been a fortunate one. Leaving out of consideration cases treated by others or self-treated, I have not observed epididymitis in to exceed one in twenty cases of urethritis. In some of these I have been able to attribute the disease to some specially exciting cause. My belief is that, with the general adoption of conservative treatment and the maintenance of sexual hygiene and rest, cases of epididymitis would be extremely infrequent.

Epididymitis is due to one of two conditions, viz.: secondary mixed infection, or direct extension of inflammation. I do not believe the microbes of the virulent process or their products can be transferred to the testicle by contiguity without exciting inflammation of the intervening structures. Certainly we have two clinically distinct varieties, viz.: one in which the epididymitis is preceded by inflammation of the vas deferens and swelling of the spermatic cord, and another in which the inflammation of the testis is the first and only thing noticed. It is conceivable that staphylococci might migrate to the testis and find in the tissues of the epididymis a *locus minoris resistentiæ*. The occasional supervention of suppuration of the epididymis is in itself suggestive.

There are several modes of conveyance of the infection to the epididymis. These are: (1) Direct extension of the inflammatory process to the prostatic sinus and thence to the vas deferens *via* the ejacula-

tory ducts. This extension may be excited by sexual imprudence, alcoholics, over-exertion, or strong injections bringing on an exacerbation of the anterior urethritis, which rapidly extends backwards. (2) Injections, soluble bougies, or catheters may carry the infection directly to the mouths of the ejaculatory ducts. (3) It is probable that pus microbes may emigrate to the epididymis without exciting inflammation in the intervening structures. Such cases constitute the old-time "metastatic inflammations of the testis."

It is to be remembered that injections may be strong enough *per se* to set up inflammation of the deep urethra, with consequent extension to the testis. It is within the domain of possibility that trophoneurotic disturbance of the testis, excited in some persons by the reflex irritation produced by the urethritis, may be a predisposing factor in epididymitis.

Symptoms.—In those cases in which direct extension of inflammation occurs, the patient first experiences pain in the groin and along the spermatic cord. Within a few hours swelling and tenderness of the cord within the inguinal canal are perceptible; sometimes the swelling is so marked that strangulation occurs, with resulting faintness and depression, nausea and vomiting. So pronounced may be the symptoms of strangulation that the condition is liable to be mistaken for strangulated hernia. I have been called on two occasions to operate upon strangulated hernia and

found gonorrhœal inflammation of the spermatic cord —the initiatory symptom of epididymitis. On the right side appendicitis may be closely simulated. I believe that in many of these cases a certain amoun of pelvic peritonitis exists. The possibility of peritonitis as a result of lymphatic infection has been demonstrated.

In many cases the testicle is either alone involved, or the inflammation of the cord is—clinically, at least—second in the order of events. The epididymis becomes swollen, hot, and tender; it can be easily outlined at first, but later on the testis may be so swollen that the epididymis is hard to outline distinctly. This depends upon the extent of involvement of the tunica albuginea and the tunica vaginalis. The pain increases as the testicle enlarges, and there is more or less fever, nervous irritation, rapid pulse, and perhaps nausea and vomiting. Should the effusion into the tunica vaginalis be great (acute hydrocele), the resulting pain may be absolutely agonizing. As a rule, the inflammation begins to subside within a week and the condition is practically recovered from in two or three weeks.

The epididymis is left in a knobby, indurated condition for some time—perhaps for life. This is very important as bearing on the question of sterility in the male. Epididymitis often puts a testicle permanently out of service by blocking up the minute gateway of the semen; if both testes are involved, the

inference is obvious that, while the potency of the patient may be unimpaired, he is ever after sterile. This should be borne in mind and the patient carefully treated by electricity, alteratives, and counter-irritation after the acute inflammation has subsided. The importance of this should be duly impressed upon him.

Peritonitis has been known to result from epididymitis. It seems that the peritoneum and testis are associated through the medium of the lymphatics.

In strumous, cachectic, tubercular, or debilitated subjects, abscess and tubercular and pseudo-tubercular testis may result, and lead to constitutional tubercular infection, or loss of the testicle, castration being often necessary.

GONORRHŒAL RHEUMATISM.

Gonorrhœal rheumatism is an important, although infrequent, complication or sequel of gonorrhœa. The possibility of its occurrence is disputed by some surgeons, but the greater number of authorities admit that some individuals, who are perhaps free from predisposition to ordinary rheumatic troubles, suffer severe pain and tenderness of one or several articulations, attended with more or less constitutional disturbance and synovial effusion, in the course of urethritis, and that in others the same process attacks various tendinous and ligamentous structures of the body. Some are subjected to this complication with every attack

of urethritis. It is most likely to occur after the urethral disease has become more or less chronic; still I have known it to make its appearance within three days.

Few diseases have been the occasion of more controversy regarding their origin than has gonorrhœal rheumatism, and its pathology must be regarded as still *sub judice*. It does not appear to arise as a consequence of varying atmospheric conditions, from over-exertion, nor, it is claimed, from any particular method of treatment of urethritis. The latter proposition, however, I am inclined to question, from practical experience, especially in connection with a case which recently came under my observation, in which the disease followed successful abortive treatment of urethritis. Its dependence upon purulent inflammation of the urethra is all that has so far been absolutely established, and, as a case which I shall shortly relate tends to demonstrate, it is by no means necessary that actual suppuration of the mucous membrane should be present in order to give rise to it. It is claimed that, inasmuch as it occurs independently of the ordinary predisposing and exciting causes of rheumatism, and is seen in only a small proportion of the subjects of urethritis, it must necessarily be the result of individual idiosyncrasy. There is probably much of truth in this assertion.

The most general opinion in regard to the pathology of gonorrhœal rheumatism is that it is a mild

sort of pyæmic infection, due to absorption of the products of purulent inflammation of the urethral mucous membrane. There is hardly a doubt of the correctness of this view; still, as might be supposed, it would be difficult to positively prove it. According to Neisser and others, the disease is due to the transference of the gonococci to the structures affected, inasmuch as the alleged germ has been found in the fluid of arthritic effusions in this disease. It is well-nigh certain that some poisonous material, elaborated by the virulent process affecting the urethral mucous membrane, is absorbed into the circulation and conveyed to the joint structures. In some individuals these tissues are extraordinarily sensitive, and as a consequence reaction occurs in the form of arthritic effusion. Whether the gonococcus is the exciting cause, or some organic chemical compound formed by the purulent process, is open to question; I favor the latter view. It is probable that pus microbes are at the bottom of those exceptional cases in which suppuration occurs. I am inclined to think that certain elements in the surgical treatment of gonorrhœa are primarily responsible for the absorption of infectious materials. I have already alluded to the destructive effect exerted by strong injections and the rude introduction of instruments upon the epithelium covering the urethral mucous membrane. When this membrane is abraded, or, as is often the case, almost entirely removed, it is obvious that the absorption of

organic poisons is greatly facilitated. I do not believe absorption occurs very readily through the intact mucous membrane, even when the latter is severely inflamed. When once the epithelium is destroyed, however, absorption may quite easily occur. It is evident that the relative facility of absorption in certain individuals explains their susceptibility to gonorrhœal rheumatism. The immunity enjoyed by women is an evidence of the correctness of this view, for the only possible explanation of the rarity of the disease in the female is that the relatively tough vagina and endometrium, and not the urethra, are the seat of the disease, and as a consequence absorption does not readily occur—and I think that when it does occur, a typically virulent and acute vaginitis will be found to have existed which has extended into the urethra and bladder. The disease in the male does not usually follow primarily simple urethritis.

There is a question in my mind whether gonorrhœal rheumatism is due to any specific property of the poison of virulent urethritis, as I have seen it arise in cases where, so far as could be learned upon examination of the patient, there was no reason to believe that the original malady was of a virulent character. I have related a case illustrative of this in connection with the diagnosis of virulent urethritis. Under such circumstances the purulent process is as severe as though the origin of the disease were indubitably virulent infection. Some cases are probably due to mixed infection.

It is probable that cachectic, strumous, gouty and rheumatic patients are peculiarly liable to the rheumatic complications of urethritis.

Symptoms.—These resemble the symptoms of rheumatic gout rather than those of the ordinary form of articular rheumatism. As a rule, the local evidences of gonorrhœal rheumatism are not severe, and consequently the constitutional symptoms are comparatively mild; but there are exceptions to this rule, as will be seen in connection with the case shortly to be described. The disease develops, as a rule, during the decreasing stage of urethritis, sometimes during the second or third month; some authorities claim that it occurs in from five or six to sixteen days, but in most of the cases I have observed the date of its appearance has been later. The explanation that suggests itself to me is that the inflammatory thickening of the urethra inhibits to a certain extent absorption from the surface of the mucous membrane. Then, too, abrasion and removal of the epithelium are not so apt to occur within a few days as later on, for not only are the poisonous products of the purulent process less virulent in the first few days, but the resisting power of the epithelium affords a temporary protection.

Usually the urethral discharge shows no change in volume with the development of the rheumatism; rarely it is lessened—most probably because the patient keeps quiet after the development of joint

complications, and this in itself is likely to benefit the urethritis. I doubt whether gonorrhœal rheumatism ever acts as a revulsive or derivative upon the inflammation of the urethra. It is said that when the rheumatism comes on late in the course of gonorrhœa, there is liable to be an exacerbation of discharge for a few days; but I am inclined to think that in this assertion the *propter* and *post* are confounded—it is more probable that from some particular cause exacerbation of the urethritis occurs, with a coincident rapid formation of its characteristic toxic principles, and, the mucous membrane of the urethra being extensively abraded at this time, absorption readily occurs, producing arthritis or other rheumatic symptoms.

The location of gonorrhœal rheumatism varies in different individuals, and sometimes in the same patient in different attacks.

The structures involved, in the order of frequency, are: (1) The articulations; (2) the synovial thecæ of tendons and muscles; (3) synovial bursæ and the sheaths of nerves. Associated with the latter form there is apt to be inflammation of the pericardium, the cerebral meninges, and the deeper structures of the eye. I have seen several cases in which the eye alone was involved (gonorrhœal descemetitis). A marked predilection is exhibited for the more important joints, the knee being perhaps most often affected. As a rule, the inflammation expends most of its violence upon one joint, although in perhaps the larger

proportion of cases several joints are eventually affected.

Varieties.—Fournier presents a classification involving three distinct varieties of the disease, as follows:

1. Generally mono-articular inflammation, most often attacking the knee, occasionally the ankle or elbow. This form is really a passive hydrarthrosis with much effusion, characterized by very insidious development. Pain, tenderness, redness, heat and constitutional disturbance are either absent or very moderate. Resolution takes place very gradually, and it is usually some months before recovery can be said to be complete, and even in these cases ankylosis may occur. In some instances the mono-articular form is excessively painful, attended by marked constitutional disturbance, and tends to affect secondarily the bones entering into the formation of the articulation. The fluid in such cases is apt to contain more or less purulent material, strongly resembling that discharged from the urethra.

2. A variety not unlike articular rheumatism. This is accompanied by a moderate amount of local and constitutional reaction. Several joints are usually involved, and very often the tendons, various other fibrous structures, and the eye are implicated. The symptoms are not so severe as in acute rheumatism, and generally reaction is very mild as contrasted with the magnitude of the joint and other difficulties. The

disproportion between general and local symptoms is an important point in differential diagnosis. The involvement of the joints is usually consecutive, but there is none of the articular delitescence characteristic of acute rheumatism. Profuse sweating, acid urine, and excessive plasticity of the blood, which are so characteristic of inflammatory rheumatism, are absent in the gonorrhœal variety. The serous membranes, such as the pleura, endocardium, and pericardium, are not often attacked. A favorable result generally occurs, but chronic synovitis, strumous arthritis in certain subjects, joint stiffness, and complete anyklosis are possible sequelæ. Fournier claims acute suppuration does not occur in gonorrhœal rheumatism; some other authorities say it is occasionally seen; I am satisfied that a joint may contain a moderate amount of purulent fluid and still not require radical surgical interference to effect a favorable issue —which is not apt to be the case with ordinary suppurative arthritis.

That suppurative arthritis may occur as a complication of gonorrhœa, I am convinced from experience. A recent case of mine, shortly to be described, is an excellent illustration of this variety of gonorrhœal arthritis.

3. (a) *Indeterminate transitory pains in various joints*, without any local or general evidences of disease; in these cases there is apt to be an exacerbation of the pain, and perhaps a distinct involvement of the

joint, coincidently with increase in the urethral inflammation. (b) Thecitis occurs, the synovial sheaths become swollen and somewhat tender, and in some cases there is moderate redness along the affected tendon. Movement of the muscle attached to the tendon is very painful. The synovial bursæ may become involved; that lying under the tendo Achillis, and another beneath the inferior tuberosity of the os calcis, are the ones most often implicated; patients thus affected complain of pain and tenderness in the heel. *This particular symptom is not unusual in the course of gonorrhœa.* Myalgia, resembling the ordinary form, and perineuritis, occur sometimes in the course of gonorrhœa, and seem to be attributable in certain instances to the same pathological condition that gives rise to ordinary gonorrhœal rheumatism. Severe pain in the back, simulating acute lumbago, is very frequently seen, but I have attributed this in the majority of instances to over-stimulation of the kidneys by the various balsamic preparations, sandalwood being particularly apt to produce it; I have, however, observed it in patients who have not taken such drugs. Whether reflex neuralgia would explain these cases, is open to question.

Cases are occasionally seen in which gonorrhœal rheumatism limits itself to a single nerve. Thus, one of my patients has an attack of sciatica coincidently with every attack of gonorrhœa; simple urethritis suffices to bring it on. The first attack of gonorrhœa

which he ever experienced was attended by sciatica of a very severe character, both nerves being involved.

It is somewhat remarkable that authorities so universally concede the comparative painlessness of gonorrhœal rheumatic processes. I have found that quite a liberal proportion of cases are attended by severe pain, and very often by sweats quite as profuse as attend ordinary rheumatic fever. The perspiration seems to be most marked at night, and differs from that of ordinary rheumatism in its lack of acidity, its more prostrating character, and its greater profuseness.

The following case illustrates the morbid possibilities of gonorrhœal infection of the joints:

A young man, aged 20, consulted me regarding a urethritis which was just beginning to develop on the third day after suspicious exposure. There was only a little redness and mucoid secretion at the meatus. At his earnest solicitation I attempted to abort the inflammation by the use of a ten-grain solution of silver nitrate, a single injection of which was thrown into the canal to the depth of about two inches, immediately followed by a solution of sodium chloride. There was comparatively little pain and only moderate reaction following the treatment, and the patient was put upon alkaline diuretics. It appeared for several days that the patient was well out of his difficulty, there being at no time during the course of the case a free purulent discharge, that which did exist being

of ichorous appearance and very scanty; in fact, after the development of the rheumatism, no further attention was paid to the urethra, so slight were the local symptoms. On the morning of the fifth day he presented himself to me with a slightly swollen condition of the left knee. The part was not tender, nor did it pain him particularly in walking. I immediately, however, ordered him to bed with hot applications. By the following day the joint was considerably swollen and very painful, constitutional symptoms being marked, and the temperature 102°. Within a day or two the swelling, pain and tenderness were extreme, and the temperature had risen to 103°; to induce sleep, I was compelled to resort to the liberal administration of morphia. On the fifth day after the inception of the arthritis, it seemed advisable to attempt to relieve the pain by aspiration; I therefore drew off about two ounces of sanious-looking fluid, which deposited on standing a distinct layer of pus, constituting about one-quarter the bulk of the fluid. This purulent material was of a greenish color and strongly suggestive of the appearance presented by the discharge of virulent urethritis. Considerable relief was obtained from the tapping, and it was therefore twice repeated, at intervals of one or two days. Within two weeks it was evident that tibial and femoral osteitis had developed, and a few weeks later the femur was enlarged for half its length. After a time hectic symptoms developed, the fever

running from 102° to 103° in the afternoon and being followed by profuse colliquative sweats, with subsequent marked exhaustion. So severe were the symptoms that I suspected tubercular invasion of the joint, particularly as the patient was of a decidedly slender build, tall, of very light weight, and came of consumptive stock. The case was treated as an ordinary case of arthritis, first by extension and hot applications, later on by fixation with plaster dressing. When this was removed the knee was treated by counter-irritation and the internal administration of potassium iodide. It was fully four months before the patient was able to leave his bed, and at this time the joint was firmly ankylosed. I succeeded, however, by four successive operations under chloroform, in breaking up the ankylosis and obtaining almost the normal degree of movement. One year after the inception of the disease the patient was able to walk without the aid of a cane, and there was nothing to suggest the existence of joint trouble. It is worthy of note that the late Dr. Chas. T. Parkes, who saw this case with me in consultation, condemned the limb to amputation.

OCULAR COMPLICATIONS OF URETHRITIS.

The ocular complications of gonorrhœa necessarily come under the province of the ophthalmologist, yet inasmuch as they are apt to be primarily presented to the general surgeon, it is proper to de-

vote a little attention to them. There are two forms of ocular complication occurring in the course of gonorrhœa; one of which is due to local infection of the conjunctiva, and the other to the same constitutional impression that gives rise to gonorrhœal rheumatism.

As regards the prognosis of the two affections, there exists the widest difference, the local infection resulting very often in destruction of the eye, while the constitutional difficulty is rarely productive of serious results.

Gonorrhœal ophthalmia, or the form due to the constitutional impression of a gonorrhœa, is of a distinctly rheumatic type. It is well known that persons affected with the ordinary form of rheumatism, or afflicted with the rheumatic diathesis, are peculiarly predisposed to inflammation of the conjunctival mucous membrane, and in many cases to iritis. In this relation gonorrhœal rheumatism is like the ordinary form; rarely, however, does definite iritis occur, and in several cases which have come under my observation I have been inclined to believe the implication of the iris to be a coincidence rather than a condition secondary to the gonorrhœa.

According to some authorities, gonorrhœal ophthalmia is most often associated with involvement of the joints, particularly when the latter is polyarticular. In my limited experience, however, the ocular complication has occurred independently of

rheumatic symptoms in other situations in the majority of instances. The inflammation may attack the conjunctiva, but more often affects the membrane of Descemet, producing the condition known as descemetitis or aquo-capsulitis. This is characterized by insidiousness of onset, the pain at the beginning being comparatively trifling; later on, however, as a consequence of mechanical distention of the anterior chamber of the eye, there may be considerable pain, varying with the amount of increase in the aqueous humor. In several instances which have come under my observation there was more or less involvement of the iris, assuming the form which has been termed serous iritis, in which the effusion was quite extensive, giving rise to intolerable pain that demanded paracentesis for its relief. The conjunctiva is usually only moderately reddened, lachrymation being considerably increased. The function of the eye is disturbed but slightly, objects having a somewhat cloudy or smoky appearance. Hæmorrhagic effusion in the anterior chamber has been described. As a consequence of serous effusion, the cornea becomes bulging and prominent, and *pari passu* with the increase in this corneal bulging the pain becomes more severe.

A form of catarrhal conjunctivitis secondary to urethritis is described by Fournier, and is supposed by him to occur independently of contagion. It is probable that such cases occasionally occur, although it would be difficult to exclude the possibility of con-

tagion. Reasoning from the effects of ordinary rheumatism upon the conjunctiva, it is reasonable to suppose that a similar catarrhal condition of the mucous membrane might result from gonorrhœal rheumatism. It is easily conceivable that the contraction of a cold during the existence of rheumatic irritation of the structures of the eye in the course of a urethritis might readily result in the production of gonorrhœal conjunctivitis.

Both eyes may be attacked in gonorrhœal ophthalmia, but simultaneous involvement is the exception rather than the rule. The prognosis is generally favorable, although, if iritis be a prominent factor in the case, synechiæ, with consequent disturbance of the functions of the iris, may result. It is possible, moreover, that complete occlusion of the pupil by inflammatory lymph may occur.

Gonorrhœal conjunctivitis is a far more serious condition than that which has just been considered, and is due to infection of the conjunctiva with the irritating products of a virulent urethritis. It is in no way different from ordinary purulent ophthalmia of a non-venereal type, unless, perhaps, it be more serious upon the average and more highly infectious. Its prognosis in the majority of instances is unfavorable. As the disease belongs more properly to the department of ophthalmology, it is unnecessary to do more than to allude to it as one of the possible and lamentable complications of urethritis.

BUBO.

Urethritis is occasionally complicated by bubo. As a rule, the glands enlarge but slightly and are only moderately tender. A moderate degree of tenderness in the groins, accompanied by little if any enlargement of the inguinal glands, is quite frequent in severe cases. The enlargement of the glands may increase until a pronounced inflammatory bubo develops—the variety of bubo formerly known as sympathetic. It is due in every instance to secondary lymphatic infection by pus-microbes. Suppuration is unusual, or at least pus rarely forms in sufficient quantity to produce a distinct abscess. It is my opinion, however, that in many cases in which a distinct bubo forms, but resolves without the formation of a clearly defined abscess, minute disseminated foci of suppuration exist throughout the gland structure. I base this assertion upon the appearance of a number of cases of this kind in which I have extirpated the enlarged glands. The foci of suppuration are chiefly distributed in the periphery of the gland. When one or more of these foci ruptures externally, peri-adenitis and phlegmonous abscess develop. Suppuration is most apt to occur in strumous, tuberculous, or otherwise cachectic subjects. Patients recently syphilized are also liable to pus-formation in the affected glands. Trauma or straining efforts in lifting, and over-exertion of any kind, appear to have some influence in determining the occurrence of bubo.

BALANITIS AND BALANO-POSTHITIS.

Inflammation of the mucous membrane of the glans penis (balanitis) and of the preputial reflexion (posthitis) are frequent complications of gonorrhœa. The two conditions are usually associated (balano-posthitis). The cause is irritation, produced by retained and decomposing secretions—usually beneath a tight and elongated prepuce, although this is not absolutely necessary.

Pus is formed by the inflamed surface, which becomes reddened, tender and excoriated from maceration and removal of its epithelium. Ulcerations of a herpetic or chancroidal character may be formed. It is my own opinion that true chancroid may be developed under a tight and inflamed prepuce. Bubo may result from the balanitis rather than from the gonorrhœa on which the latter depends.

VEGETATIONS.

As a result of prolonged irritation, combined with some peculiar instability of local nutrition—or trophoneurosis,—there develop in some patients fungoid growths upon the mucous membrane of the glans and prepuce. These are composed of heaped-up epithelium covering delicate capillary vascular loops. They are very delicate, painless, and bleed readily. They resemble the vegetable fungi in that their development is favored by heat, moisture, darkness, and filth. They resemble a cauliflower in their physical appear-

ance. When the conditions favoring their growth are perpetuated, they sometimes attain an enormous size. They are especially likely to develop in women. They may undergo transformation into hyperplastic tumors, particularly in women.* The term "venereal vegetations," oftentimes applied to these growths, is a misnomer, as they are in no sense venereal, and may appear in patients who have never had venereal disease of any kind.

Balano-posthitis is very favorable to the development of vegetations, and they are quite likely to develop in any case where the prepuce is long or constricted.

LYMPHANGITIS.

Inflammation of the lymphatic vessels of the penis occasionally occurs in urethritis. The prepuce becomes swollen and œdematous, and sometimes presents an appearance identical with that of erysipelas. Abscesses may form along the lymphatic vessels. Occasionally the inflammation is limited to a few lymphatic vessels and does not involve the entire prepuce.

Lymphangitis is due to secondary and probably mixed infection rather than to the virus of the urethral inflammation *per se*.

**Vide* Taylor (New York Medical Journal), "Chronic Inflammation and Ulceration of the Female Genitalia." Also a paper of my own in the Chicago Medical Recorder, vol. i.

In cachectic subjects, sloughing of the prepuce and denudation of the penis may occur.

Chronic induration — indurating œdema — is an occasional result of lymphangitis. This is most likely to occur in syphilized patients.

CHAPTER IV.

GONORRHŒA IN THE FEMALE.

Gonorrhœa in the female is usually relegated to the department of gynæcology, but it would be impossible to thoroughly discuss the subject of venereal diseases without devoting a few moments to the special consideration of the effects of the gonorrhœal virus upon the female sexual organs—more especially as the poison, germ, virus, or whatever we may choose to term it, is primarily generated in this sex. It is a peculiar fact that gonorrhœal inflammation in the female rarely presents a condition analogous to that observed in the male. Vaginitis of venereal origin is exceptional in women; and urethritis—the only real analogue—is excessively rare, and does not often occur even when virulent vaginitis exists. The rarity of virulent vaginitis, even among that numerous class from whom the male sex acquire the disease, is only explicable by the following circumstances: (1) The existence of latent gonorrhœal processes, of a greater or less degree of virulency, in the female. (2) The acclimation of the vaginal mucous membrane to the toxic products of organic decomposition gradually formed in the female generative apparatus; if the proposition be accepted that the urethra of the male may become acclimated to morbid conditions existing in the female, it must also be admitted that the vagina

of the female becomes inured to the contact of the irritating products of morbid conditions of the mucous membrane higher up, or, in other words, becomes tolerant of autogenetic poisons; this same tolerance explains her resistance to the disease when brought to her by contagion. (3) The relative inherent toughness of the vagina, as a consequence of which it may serve as a vessel in which toxic materials may be elaborated without itself becoming affected by them; this inherent resistance does not extend to the endometrium, Fallopian tubes, and peritoneum—hence a woman may have more or less active gonorrhœal processes in these parts while the vagina is apparently perfectly healthy.

The importance of a knowledge of the direct and remote results of gonorrhœa in woman can hardly be over-estimated, and is but just now receiving the attention it demands. Foreshadowed by the labors and once-ridiculed theories of Nöggerath, the researches of modern operative gynæcologists are developing most astonishing facts relative to the subject in question.*

It must be remembered in this connection that there are two ways in which the gonorrhœal virus

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*The best article that has yet appeared upon gonorrhœal infection in women is, in my opinion, that recently published by William Japp Sinclair, of Manchester, England, reproduced in Wood's Medical and Surgical Monographs, February, 1889, vol. i.

may act in the production of morbid conditions in women; and this fact, unfortunately, seems to have been overlooked by Dr. Nöggerath and those of his school. These investigators seem to believe that the morbid results of gonorrhœa which are manifested by diseased conditions of the uterus, Fallopian tubes, parametrium, and ovaries, are the result of a primary infection derived from uncleanly intercourse. This, however, is a one-sided view of the question, for, as a consequence of various exciting causes, the pelvic organs of the female may become infected by irritating materials derived from various inflammatory and putrefactive processes in her own generative apparatus, not necessarily dependent upon antecedent contagion. Thus, while willing to accept in the main the doctrines of Nöggerath and his disciples, I am strenuously opposed to the claim that infection from without is the *fons et origo mali* in anything like the majority of cases.

Nöggerath's theory implies (1) that nearly all individuals who have at a more or less remote period contracted gonorrhœa, and have apparently been cured, are capable of imparting infection to the female — thus men who have at some time had this disease, according to Nöggerath, infect their wives in the majority of instances; (2) that this condition of infectiousness on the part of the male is in many instances latent, but may possibly become perceptible by the occurrence of urethritis of greater or less severity as a

consequence of sexual intercourse, etc.; (3) that, as a consequence of this latent condition of gonorrhœa in the male, there occurs a similar latent infection of the wives of individuals thus infected; (4) that most wives of men who have at one time or another been affected with gonorrhœa become sooner or later the subjects of uterine and pelvic inflammations.

There is something very striking in Dr. Nöggerath's theory, more especially if we take into consideration the large proportion of women—and particularly those in large cities—who have pelvic and uterine inflammations of various kinds. It is certainly peculiar that the matrimonial state should entail upon the female so many varied, severe, and annoying difficulties affecting the sexual organs. Faulty hygiene, improper habits and modes of living, with an attendant hereditary transmission of physical defects, in combination with sexual excesses, explain these troubles to a certain extent. Add to these factors that of deliberate and vicious interference with Nature's processes, in the performance of abortions, and we have a series of all-sufficient causes for gynic diseases in women. It must be remembered, however, that the disproportion in the frequency of occurrence of gynic disease in city-bred women, as contrasted with those living in small towns or in the country, is greater than could be reasonably accounted for by the various causes just mentioned. Add the element of prostitution and illicit intercourse—the opportunities for which

are relatively greater in cities—with their attendant facilities for the generation and transmission of infection, and the explanatory chain is complete.

With regard to the frequency of gonorrhœa among the inhabitants of cities, Nöggerath said some years ago: "I do not know what the state of matters in other cities is; I did not know how we stood in New York until I questioncd the husband of every woman who came under treatment; and I believe we may here apply the dictum of Ricord, that in every one thousand men eight hundred have had gonorrhœa." He goes further, and says: "I believe that I do not exaggerate when I say that gonorrhœa in 90 per cent. of the cases remains uncured. Of every hundred women who have married men formerly affected with gonorrhœa, hardly ten remain well. The others are afflicted by some of the ailments which I have attempted to describe." *

Making due allowance for exaggerations upon the part of converts to the doctrines of Nöggerath and his school, it must still be admitted that the poison of gonorrhœa may produce any or all of a series of disastrous results in the pelvic organs of women. Thus they may have metritis and endometritis, salpingitis, hydro- and pyo-salpinx, inflammation of the ovaries, parametritis and pelvic peritonitis, menstrual

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*"Morbid Results of Latent Gonorrhœa in the Female," 1872.

disorders, and sterility, according to the severity of the process and the structures affected. Although rare, vesical, urethral and renal disease of an inflammatory character may occur as in the male. It is to be remembered, however, that these results may occur without the contagium being derived from without. The point of departure is certainly not the urethra of the male, but, as far as clinical evidence and theoretical reasoning enable us to judge, must of necessity be the generative apparatus of the female. Admitting this to be true, it is an indubitable fact that any woman whose generative apparatus is capable of infecting any unfortunate male with whom she may chance to have intercourse is also capable, under favorable conditions, of infecting any portion of her own generative tract which happens to be susceptible to the irritating effects of the autogenetic poison. Such infection may occur without any exciting cause, although in perhaps the majority of instances some special circumstances or other are necessary to the development of infectious inflammation. For example, we will suppose that a woman of uncleanly habits, easy virtue and debilitated constitution suffers from a miscarriage, as a consequence of which her parturient canal is in a wounded condition; the same poison—which various circumstances of environment have caused to develop in her generative apparatus —that would develop urethritis in the male, may obviously produce in her such inflammatory condi-

tions as severe metritis, endometritis, salpingitis, cellulitis, pelvic peritonitis, etc., etc. It is admitted that the male may contract urethritis from women who have, as far as can be determined, no specific inflammatory condition of the generative tract, but who are uncleanly and are afflicted with ordinary catarrhal conditions of the mucous membrane, which catarrhal conditions generate an acrid discharge. Is it not reasonable to suppose that, when the sexual organs of such a woman become wounded in the process of parturition, she becomes susceptible to the local effects of this same autogenetic poison? I venture to assert that, leaving out of consideration cases of pelvic inflammation due to septic infection at the hands of the accoucheur, the majority of cases of pelvic disease following labor—premature or normal —are due to auto-infection. There may be absolutely no lines of differentiation to be drawn between cases in which the irritant poison is developed *de novo* in the woman, and those in which it has been imparted to her through uncleanly intercourse. The results are the same.

While it is unquestionably true that many cases of urethritis in the male remain infectious for some time after gonorrhœa is apparently cured, I am still of opinion that cases in which the disease has been apparently cured for six months or more are, in the absence of stricture, non-contagious; and there are instances in which, notwithstanding the fact that a

slight stickiness of the meatus persists, there are no properties of contagiousness and it is perfectly safe to advise the patient to get married. That extreme caution is necessary in this respect, I am willing to admit; and that a patient with stricture should not be allowed to marry until after proper treatment, goes without saying. I have no disposition to antagonize in any sense the views of the Nöggerath school, *but I must, nevertheless, protest against the illiberality of ascribing the results of gonorrhœal infection in all cases to contagion, with a total disregard of the numerous morbid possibilities of auto-infection.*

Gonorrhœal vaginitis is usually seen in comparatively cleanly and healthy women, who have become infected with the products of virulent urethritis in the male. *The younger and more cleanly the patient, the more virulent the vaginitis.* It is a startling fact that vaginitis in young children is apt to be very severe. I have seen but two instances of virulent vaginitis from contagion in young female children—one in a child of ten, the other in a child of four, each of which I was able to trace to its source. The inflammation was very intense; rarely, indeed, is so high a grade of inflammation seen in the adult female.

In connection with the possible infectiousness of chronic urethral disease in the male, I will again call attention to the possibility of the transformation of the virulent process in such a manner that, although it is no longer capable of exciting virulent inflamma-

tion, there are formed at the site of the urethral disease toxic compounds or ptomaïnes capable of exciting gynic disease of various kinds in the female.

The possibility of gonorrhœal processes in the female becoming latent is of very great importance with reference to the transmission of the disease to the male. For example, supposing a woman has had gonorrhœa, which is now localized in the Fallopian tubes; it is probable that under sexual excitement or during menstruation a small quantity of the retained poison may be extruded into the uterus and, mingling with the secretions of that organ and with those of the vagina, eventually come in contact with the urethra of the male, exciting therein virulent urethritis. Her own mucous membranes are no longer susceptible to the irritant action of the virus, having been exhausted of their susceptibility by the primary infection. Upon examination, such a woman would present no trace of virulent disease, although she would invariably be found to have more or less pronounced uterine difficulty. A parallel case might occur in which the primary source of the disease was not infection from without. Supposing, for example, that as a consequence of sexual excess, filth, simple uterine inflammation, intemperance, cachexia, or any such cause, a woman develops the irritating poison of gonorrhœa, which in course of time *localizes itself in the Fallopian tube and endometrium. As a consequence of some of the exciting causes mentioned, the pent-up poison is discharged into the*

vagina, and causes urethritis in the first male who has intercourse with her. Upon examination she presents no evidence of disease other than ordinary endometritis—perhaps only a mild form of that. To go a little further in describing the morbid possibilities of this latent gonorrhœal process of the Fallopian tubes, we will suppose that a small quantity of the poison is discharged into the peritoneal cavity; obviously, localized peritonitis would follow, with possible pelvic abscess—or rarely, perhaps even fatal general peritonitis. It is a striking fact that general peritonitis is not usually liable to be produced by these latent gonorrhœal processes — probably on account of some transformation of the virus; it may, however, occur as a consequence of gonorrhœa, but almost invariably as a direct result of rupture of pelvic abscess—which is in itself due to gonorrhœal infection—or extension of virulent vaginitis, endometritis, or salpingitis.

It is probable that chronic gonorrhœal inflammation may affect the glands of Naboth and of Bartholini; the woman might then go on transmitting the contagium of urethritis for an indefinite period after all visible evidence of virulent vaginitis had disappeared—this being another of those puzzling cases in which urethritis is contracted from an apparently healthy woman.

The urethra of the female, owing to its protected situation, is very rarely involved in virulent inflammation. The vulva—or at least the more external por-

tions of it—not being particularly susceptible to the products of virulent inflammation, the process does not readily extend itself to the meatus. Clinically, it seemingly never does so, excepting in cases of virulent vaginitis due to contagion. Whenever, in the course of a vaginitis, urethritis develops, with or without inflammation of the bladder, it is *prima facie* evidence that the disease was primarily due to infection.

It has been claimed by Martineau that the reaction of the secretion of vaginitis determines the diagnosis of its specific or non-specific character. He claims that the pus of specific vaginitis is always acid, while in the simple variety it is alkaline. I trust that this fallacious test may not be depended upon for the differential diagnosis, inasmuch as up to the present time no other observer has been able to confirm the opinion of Martineau. I am not yet perfectly satisfied that it is absolutely safe to assert a positive opinion based upon the absence or presence of gonococci. Gonococcal inflammation may be contracted from women whose discharges contain no gonococci. It is, of course, admitted that gonococci may be discharged from some crypt or follicle during coitus and yet fail to appear at other times. From a medico-legal standpoint, I do not believe that the discovery of the gonococcus has enabled us to give dogmatic opinions in perhaps the majority of cases.

CHAPTER VII.

THE TREATMENT OF ACUTE URETHRITIS.

The treatment of urethritis comprises a greater variety of methods and remedies than that of almost any disease which could be mentioned. This fact is in itself strong circumstantial evidence of the self-limited—and, as far as specific medication is concerned, incurable—character of the disease. Manifold as are the panaceas and specifics for urethritis, the fact still remains that none of them, taken alone, has materially diminished the average duration and severity of the disease. Measures of treatment based upon the principle of the self-limitation of the malady and an appreciation of the impracticability of attempts to jugulate it, have accomplished much; panaceas, on the whole, nothing but injury. There is scarcely a physician in practice, and probably not a "man about town," but imagines he has a specific for the "clap," the several remedies varying in position and legitimacy from the fallacious injection *brou* to the more modern application of bichloride of mercury *via* the retro-injection route. I discredit the statements of surgeons who claim to cure their cases of urethritis in a week or ten days, or perhaps less, quite as much as I do the statements of the veteran "rounder" who has a little preparation that "knocks it in three days." Candidly, I do not believe that by any special system

of medication alone a virulent urethritis is ever cured in any such time. I have hunted down all the wonderful specifics that were ever called to my attention, and tried them all faithfully, but have not yet succeeded in finding a remedy which produces the wonderful results claimed by some surgeons and by quite a proportion of patients.

Mr. Milton has well illustrated the fallaciousness of gonorrhœal specifics in his list, taken from various sources, which comprises several hundred infallible remedies, all of which have been tried and found wanting.*

Driving a gonorrhœa to a cure is generally a bad as well as an unsuccessful practice, and much harm may come of it; the best results are apt to follow a "coaxing" method—*i. e.*, mild and persistent treatment, and the acceptance of the inevitable for several weeks. The one substitute for this line of treatment which will be shortly mentioned, involves absolute rest. I think that if a remedy is ever discovered which will cure every case, even in from three to six weeks, the event will be hailed as a surgical triumph. I should be very well satisfied if I could discover a remedy which would invariably cure gonorrhœa in six weeks or less, meanwhile permitting my patient to go about his business. No matter what system of treatment may be followed, a better average result

* "Gonorrhœa and Spermatorrhœa," J. L. Milton.

than this is not to be hoped for in virulent urethritis. If, however, the surgeon lumps his cases of bastard clap and the milder forms of urethritis in with his statistics, he may achieve in a large proportion of instances the wonderful results claimed by many—and this remark is particularly pertinent when we consider the fact that the average surgeon must necessarily treat at least a half-dozen cases of mild urethritis or bastard clap for every virulent case that comes under his observation. It will be found that with due regard to the self-limitation of the disease and the intolerance of the urethra for harsh measures of treatment, fewer cases of chronic urethritis will be seen, and fewer strictures and other sequelæ will result, than with those systems of treatment which are said to cure within a few days. To be sure, cases do present themselves that are likely to shake our faith in this method of management. How often do we hear of some self-satisfied voluptuary who years ago had gonorrhœa that proved obstinate to the best professional skill for months and months, but who finally recovered and now has a prescription which has cured him of from half a dozen to twenty attacks of urethritis! The surgeon should not let such cases shake his faith in his own professional ability, for such men are constantly deluding themselves. The only virulent urethritis they ever happened to have was the first attack, from contagion, the subsequent attacks being bastard clap founded upon the damage done by

the old-time gonorrhœa. Sooner or later a second attack of virulent urethritis—or perhaps a mild case with a tendency to chronicity—is experienced (although rarely as sharp as the first), and not only explodes their faith in the erstwhile panacea, but gives them no end of trouble, and necessitates surgical measures for the removal of the cause of the numerous attacks which the alleged specific so readily subdued. I have seen many cases among my patients, of individuals who had a wonderful specific for urethritis, and who, if their own statements were to be believed, were absolutely independent of surgeons. Whenever I meet a case of this kind I am tempted to laugh in my sleeve, as I see in my mind's eye an interesting case of stricture in the not distant future.

In spite of what has been said regarding the parasitic or microbic origin of virulent urethritis, I fail to see any practical results in the way of improved methods of treatment; not that this is in any sense an argument against the microbic character of the disease, but it signifies its self-limitation. The investigations of these bacteriologists who unhesitatingly accept the gonococcus of Neisser have shown that the poison of the disease infects the entire thickness of the mucous membrane and the submucous cellular tissue so completely that repair cannot take place in well pronounced cases until the layers of affected cells have been replaced by new and insusceptible connective-tissue cells from beneath. This proves positively

that nothing short of caustic applications capable of destroying the entire thickness of the mucous membrane can by any possibility abort a virulent urethritis when once it is thoroughly established. As a corollary, it is obvious that any attempts at the abortion of a virulent urethritis must be made in the very incipiency of the disease—before, in fact, it is possible to determine whether the case is simple or virulent; for, inasmuch as the different grades of urethritis often begin in precisely the same manner, it is impossible to tell for a few hours, or perhaps several days, whether we have to do with a virulent type of the affection or with the simpler and more curable variety. Any form of treatment the efficacy of which is supposed to depend upon the action of antiseptics on the specific germs of the disease must, in order to shorten the duration of the affection, be applied within a few hours of its inception. Thus the disease can be aborted, if the term "abortion" is proper as applied to something which does not already exist—for the poison begins to produce irritation of the epithelium of the urethral mucous membrane very soon after its introduction into the canal, and if it be destroyed *in loco* the disease may be said to have been prevented rather than aborted.

The two methods of treatment applicable to urethritis may, for the purpose of discussion, be divided into: the jugulative, or abortive; and the methodical, or rational.

The abortive method has been generally understood to imply the substitution of a simple for a specific inflammation. This is a relic of bygone days, which has impelled surgeons of excellent reputation —and undoubted wisdom in other directions—to rub the pure crayon of silver nitrate upon eyes affected by virulent conjunctivitis. I doubt not that there are surgeons at the present time who advocate this very method of treatment for this particular disease. During my term of service as hospital interne I saw this method applied on several occasions, and in every instance it was followed, not by the substitution of a simple for a specific inflammation, but by complete destruction of the visual capacity of the eye. I remember asking one of the house staff who applied this method in a case of virulent ophthalmia, under the advice of a prominent specialist (recently deceased), how he knew which had destroyed the sight, the disease or the treatment. He replied that it was impossible to say positively, but that it must be the disease, because "they all went that way anyhow." Arguments are useless, opposed to such logic as this; but I trust that in respect to urethritis it is unnecessary to protest against such pernicious doctrine.

THE ABORTIVE METHOD.

The abortíve method of treatment as applied to urethritis should properly imply, not the fossilized and sophisticated idea of substitution of one type of

inflammation for another, but, *first*, the removal as far as may be of the virulent or irritant materials which have been deposited upon the surface of the mucous membrane, and which, although they have begun to manifest their presence by slight irritation at the meatus or just within it, have not yet deeply penetrated into the substance of the mucous membrane and infected the sub-lying cells; *second*, the neutralization of the virus by means of antiseptics or germicides—meaning in this instance any chemical substance capable of neutralizing the organic poison of urethritis without destroying the mucous membrane.

These requirements are the more readily fulfilled because the disease begins at the meatus, or at most in the fossa navicularis, and gradually affects contiguous areas of mucous membrane. The substance most generally used in the abortive method of treatment is nitrate of silver. This may be used in two ways: (1) by the injection of a mild solution at frequent intervals; (2) by means of a single injection of a comparatively strong solution. If properly done, and at an appropriate period in the incipiency of the disease, either one of these methods is usually safe and is not likely to result in stricture—the principal danger of the abortive method. A solution of silver nitrate, fifteen grains to the ounce, may be thrown into the canal by means of a small drop syringe, which is passed into the urethra for about two inches, the fluid being ejected as the syringe is slowly with-

drawn. The solution is held in the urethra for a few seconds, and a weak solution of chloride or bicarbonate of sodium is immediately thrown into the canal, the patient being instructed to urinate immediately thereafter. If this be carefully done when slight discharge and itching at the meatus are first observed, the method is apt to prove successful and is devoid of danger, although as a rule it is not to be recommended for application by the general practitioner. In lieu of the strong preparation, a solution of one-half grain of silver nitrate to the ounce of water may be used, an injection being made every two hours for twenty-four hours or less—pronounced smarting during micturition being the signal for stopping the treatment.*

The best method for the abortion of gonorrhœa is prolonged irrigation of the anterior portion of the urethra with a solution of potassium permanganate in a strength of from 1:10000 to 1:5000. This had best

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*That silver nitrate is efficacious in destroying the *materies morbi* of virulent inflammation, is shown by the excellent results obtained by Credé in the prophylaxis of ophthalmia neonatorum by instillation into the eyes of the newborn infant of a 2-per-cent. solution of that drug. While the silver nitrate in careless hands is inimical to the well-being of the urethra, I am satisfied that if properly used its dangers are not nearly so great as they have been pictured. I have often used injections in a strength of thirty grains to the ounce in chronic urethritis, with the best possible results. Such injections, however, should only be given by the deep syringe.

be employed twice daily, but in most cases once daily is sufficient. Unless treatment be delayed until marked inflammation has developed, no discharge is visible after the first, or at most the second, day of treatment. If, however, the treatment is not persevered in for at least two weeks, a relapse is almost certain to occur.

Another method for the abortion of urethritis is irrigation with a weak solution of bichloride of mercury—1 : 20000. This should be used as warm as can be comfortably borne, and kept up for half or three-quarters of an hour at a time, the procedure being repeated two or three times in the first twenty-four hours, after which the treatment should be stopped.* The patient may occasionally receive benefit from self-administration of this treatment by means of the ordinary penis syringe, although retro-irrigation or irrigation through a short nozzle at the hands of the surgeon is best.

At the end of twenty-four hours of abortive treatment, whatever drug may have been used, all local treatment should be stopped for a few days – alkaline diuretics, restricted diet, and attention to hygiene being the only measures employed. In a few days, if virulent urethritis does not develop, mild astringent

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* Care should be taken not to have the water too hot, as destruction of the urethral epithelium may thereby be induced.

injections (such as, for example, one grain of iodide of zinc to the ounce of rose-water) and the internal administration of the balsams are indicated. If virulent urethritis has meanwhile developed, it must be treated as under ordinary circumstances—or perhaps even more cautiously, because of the irritating effect of the preliminary treatment.

THE RATIONAL METHOD—GENERAL MANAGEMENT.

The rational method of treatment is of necessity the one we are most often called upon to prescribe, for the reason that the patient seldom consults a surgeon until urethritis is well established.* Mild measures—attention to genito-urinary hygiene, regulation of the diet, administration of mild laxatives, and the use of weak astringent injections—usually suffice for the cure of the milder cases within a few days; at any rate they check the discharge. From what has been said of the causes of the simple forms it is obvious that surgical treatment is in most cases necessary for a complete cure, either in conjunction with medical treatment or following the cessation of the urethral discharge. Thus, dilatations or cutting operations are required for stricture; the contracted meatus must be cut; congested and granular patches

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* I use the term "rational" in contradistinction to the expectant method of Fournier, Diday, and others, which consists chiefly in the administration of placebos.

must be stimulated to repair by applications *via* the endoscope or by other suitable measures.

So intimately connected are simple urethritis and chronic pathological conditions of the canal, that it is unnecessary to further discuss the treatment of what must obviously be in the majority of instances merely a symptom. I sometimes wonder whether it would not be safe to broadly distinguish simple from virulent urethritis by saying that the simple form comprises the effects of venereal excitement, intemperance, and the contact of irritating secretions or a special poison with a canal at one time affected with violent inflammation, while virulent inflammation is the result of inoculation of a highly elaborated poison upon the virgin urethra, with or without the coöperation of the other factors just mentioned. I am tempted to believe that an individual who has once had a virulent attack of urethritis becomes so insusceptible to the disease that infection alone never thereafter causes it, apparently virulent (secondary) attacks being due to the superaddition of some extraneous source of irritation. *This may seem far-fetched, but let it be remembered that the subsequent history of the gonorrhœa patient is usually a succession of comparatively mild attacks.* Is this because he is more choice in his selection of females? But it may be urged, "the mild attacks are due to pre-existing damage in the canal"—*i. e.*, remnants of the old attack. Very true, but *wherein do such lesions protect the patient from virulent attacks, if exposure be granted—as in most cases it must be?*

The most important principle in the management of severe urethritis is the maintenance of physical and sexual rest. I might qualify the statement that there is no specific for urethritis by saying, "with the exception of absolute rest," so firm is my conviction of the benefits to be derived from it. Many individuals suffering from gonorrhœa entertain the fatuitous belief that the disease is not in itself serious—or, as they usually express it, "no worse than a cold;" hence it is difficult, or even impossible, in the majority of cases, to induce them to take a complete rest. They wish to be cured promptly, but upon entirely different principles from those which govern the management of other acute inflammatory infections. A man with a sharp attack of urethritis is certainly very sick; yet how often can he be induced to take to his bed and be treated upon the same rational principles as are practiced in other inflammations? A man with a fractured limb is compelled to rest, and, aside from the mechanical obstacle to movement, it would not be difficult to convince him that absolute quiet is necessary for a cure. There is little or no danger in a simple fracture, yet the patient is perfectly tractable. There is great danger in virulent urethritis, yet it is seldom possible to convince the patient that quiet is necessary.

A moment's reflection will convince the reader that few diseases indeed are characterized by so many and severe remote pathological possibilities as is that

under consideration. Many a man, crippled at middle age, and whose life is ever after burdened with numerous physical annoyances and perhaps serious infirmities, owes his condition to a severe attack of gonorrhœa experienced in his youth. And the immediate results are often bad enough: there is nothing more painful than an attack of epididymitis, a disease which may produce sterility or lead to abscess or gangrene and total loss of the organ involved—and this complication is among the most frequent results of urethritis; then acute and dangerous cystitis, which is an occasional sequel of gonorrhœa, is productive of much suffering—should the bladder become involved in any degree, he is indeed a fortunate individual who is not ever thereafter annoyed with vesical irritability, or perhaps chronic inflammation; prostatitis also leaves disagreeable and sometimes permanent effects.

Stricture, the most important of the sequelæ of gonorrhœa, is productive in some instances of the most profound pathological disturbances in the proximal portion of the genito-urinary tract; inflammation of the bladder, calculous deposits, dilatation of the ureters, surgical diseases of the kidney, and even the ordinary form of Bright's disease, are often directly traceable to it. Pronounced stricture generally leaves its victims with a *locus minoris resistentiæ* which favors the development of acute or chronic Bright's disease from apparently trivial causes. Few indeed are the

cases of gonorrhœa which do not affect to a greater or less extent the prostate body, and I suspect that many individuals who in after-life are afflicted with prostatic hypertrophy owe that condition to the effects of an early gonorrhœa.

It needs but a casual survey of the morbid possibilities of urethritis to convince one that it is worse than a cold. Gonorrhœa is the most dangerous of the venereal diseases, for through its sequelæ and complications it is the cause of more deaths than can be justly attributed to the direct or indirect influence of syphilis. Chancroid, as is well known, is essentially a benign disease. Subtract the evil effects of gonorrhœa from the list of human ills, and the resulting increase in the longevity and happiness of the race would be something marvellous.

It is my firm belief that every patient with a virulent urethritis should be confined to bed for one to two weeks, and that, if this could be accomplished, with fair treatment the majority of cases would not only be subdued within a few weeks, but stricture and other complications and sequelæ would be almost unheard of. In the comparatively few instances in which I have been able to carry out this plan the results have invariably substantiated this opinion. Sexual rest is a positive necessity, and it is hardly necessary to state that this implies not only physical abstinence but mental freedom from all kinds of sexual impressions and ideas.

Second only in importance to rest is attention to diet. A restricted regimen is necessary, not only because of its beneficial effects from an antiphlogistic standpoint, but for the purpose of limiting the waste products excreted with the urine. It is upon the amount and character of these waste products that the irritating properties of the urine depend; nothing is so efficacious in diminishing the urinary acridity as attention to diet. The ideal regimen is bread and milk; but if this be not acceptable, the more closely a vegetable diet is adhered to, the better; asparagus, however, is to be avoided. Stimulants, such as alcoholics of all kinds, tea, and coffee, should be interdicted.

It is not considered necessary by the majority of surgeons to restrict the patient in the matter of indulgence in tobacco. I am inclined to think that chewing is not at all injurious, but have become convinced from practical observation that smoking, unless in extreme moderation, is decidedly inimical to the cure of inflammatory troubles of the genito-urinary tract—I prohibit it as a matter of routine. Several of my patients have acknowledged that they have themselves noticed a difference in their condition according to the extent of their indulgence in tobacco. The late Dr. Bumstead held the opinion that both smoking and chewing produced relaxation of the genital organs and tended to perpetuate urethral discharges. Tobacco in excess certainly makes the

nervous system irritable and tends to promote sexual excitability. The evil influence of smoking upon the mucous membranes is probably not limited to those of the nose and throat, but extends to all the mucous tracts of the body through the constitutional effects of the weed.

The alkaline mineral waters should be given for the purpose of diluting and increasing the bulk of the urine. To these may be added the citrate, acetate, or bicarbonate of potassium, with the object of still further lessening the irritating properties of the urine by neutralizing its acidity. Profuse diuresis, providing the urine is bland and non-irritating, is highly desirable, for the urethra is in a certain sense like an infected wound, and hence requires frequent irrigation.

Cleanliness is absolutely essential, and patients with a long prepuce should be particularly cautioned to thoroughly cleanse the parts beneath and, if possible, to retract the foreskin and bathe the glans several times daily, to prevent balanitis and further cultivation of the products of virulent inflammation. Some attention is necessary to the dressing of the penis. One of the most pernicious practices that can be adopted is to bind absorbent cotton or other material over the meatus—a plan frequently followed by patients with a long prepuce—in the orifice of which absorbent cotton or lint may be packed with great facility.

Common sense should teach the surgeon that, inasmuch as the inflammation of the urethra is due to the inoculation of successive areas of the mucous membrane with the virulent products of inflammation, the process extending gradually from the anterior to the deeper portions, any dressing which dams back the discharge must necessarily feed the pathological process and enhance the danger of its extension into the deeper portions of the canal. I am satisfied that improper dressing is frequently the cause of serious complications. A very simple plan is for the patient to roll the shirt up in front out of harm's way, and to pin upon the tail of that garment a soft white handkerchief or napkin, drawing it through beneath the perineum and up over the penis in such a manner that one corner may be tucked down each leg of the pantaloons, with numerous folds of the soft cloth resting in the crotch in such a way that the penis rests therein, the meatus at the same time being unobstructed. Another very excellent plan is to pin the toe of a stocking upon the drawers or pantaloons in such a manner that the penis may hang therein without the meatus coming in contact with it. In the bottom of this receptacle a little absorbent cotton may be placed, and frequently changed. There are several cloth gonorrhœa-bags upon the market which answer the same purpose. The penis should never be dressed and allowed to remain in the upright position.

By attention to these little details cleanliness may be secured, and at the same time *free drainage of the affected membrane facilitated.* Rubber protectives should never be used. A very good retention dressing for gonorrhœa has been devised by my friend Dr. Bransford Lewis, of St. Louis; it is patterned after the jock-strap worn by gymnasts.

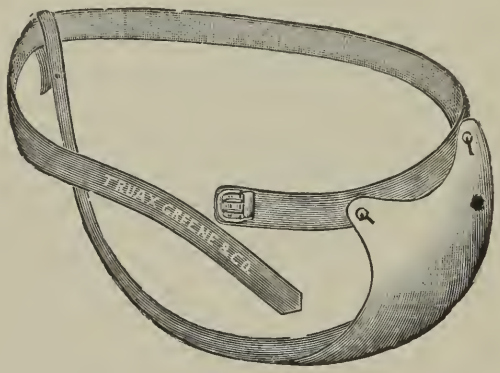

Fig. A.—Lewis's Retention Dressing.

Inasmuch as it is impossible to abort the inflammation when it has once frankly begun, it is obvious that we must content ourselves with a not too officious management of the case until the normal process of repair begins.

One of the best measures for facilitating resolution of inflammation is the application of heat, and it is nowhere more efficacious, if properly applied,

than in inflammations about the sexual apparatus. Heat applied by means of the sitz bath of from thirty to sixty minutes' duration, several times daily, will assist materially in the successful management of urethritis, particularly if there exists any irritation about the prostate or the neck of the bladder. When the patient will consent to keep perfectly quiet, it is the most valuable auxiliary method of treatment at our command. The value of the hot sitz bath has been questioned, but I am convinced of its efficacy.

In lieu of the more general application of heat by means of the bath, prolonged soaking of the penis in hot water will be found to be beneficial. When urination is very painful, relief may be obtained by passing the urine while the organ is immersed in a vessel of hot water.

The use of remedies, both internal and local, should be guided, not only by a knowledge of the natural course of the disease, but by the conditions presented at various stages in each individual patient. It would be absurd, as well as pernicious, to treat a case complicated in the stationary stage by inflammation of the bladder or prostate in the same routine fashion prescribed for the average uncomplicated case at the same period of the disease.

INTERNAL MEDICATION.

The range of internal medicaments for urethritis is not very extensive, the so-called specific remedies

being especially limited in number. During the increasing stage there is apt to be considerable fever; tincture of aconite or veratrum viride will then be found useful. I believe these remedies are not used sufficiently often.

Alkaline diluents should always be given throughout the course of the disease, either alone or in combination with other drugs. The fluid extract of pichi (*Fabiana imbricata*), a drug recently put upon the market, appears to have an excellent effect in lessening the irritating properties of the urine and soothing the inflamed mucous membrane. Combinations of buchu, slippery elm, uva ursi, linseed, etc., are all beneficial, especially if given in infusions, their action being in this disease essentially the same as in inflammation of the bladder. The ergot of rye and the ergot of corn (*Ustilago maydis*) have been recommended as exerting specific effects upon the disease. In the early stages of the affection ergot does not seem to be of any particular service, and, moreover, is very disagreeable to take; in the later stages, however, it undoubtedly exerts an astringent influence upon the inflamed surface, and may be given in quite liberal doses, in some cases with marked benefit.

The fluid extract of corn-silk (*Stigmata maydis*), in doses of one drachm every two or three hours, has been highly recommended. I have failed to notice any special benefit to be derived from it in acute gonorrhœa; it has, however, seemed to be beneficial in some cases of catarrhal gleet.

It is desirable to administer some anaphrodisiac preparation during the height of the disease, for the purpose of allaying sexual excitement and producing a direct sedative influence upon the inflamed part. A dose of twenty to thirty grains of potassium bromide at bedtime has usually the desired effect. If a more powerful effect is desired, the following mixture will be found serviceable:

℞ Fl. ext. ergotæ, ♏xv.
Tr. gelsemii, ♏v.
Potassii brom., gr. xx.
Tr. hyoscyami, ♏xxx.
Syr. aurantii, q. s. ad ℥ ss.

M. Sig.: At bed-time.

The following is also serviceable:

℞ Chloralis hyd., gr. v.
Tr. aconiti rad., ♏iij.
Sodii brom., gr. xv.
Aq. camphoræ, q. s. ad ℥ ss.

M. Sig.: At bed-time.

Either of these combinations will usually allay sexual excitability and prevent or relieve severe chordee. It may be necessary, however, in some cases in which erections are painful and troublesome, to administer an opiate. Opium has a certain degree of stimulating effect upon the sexual organs, which rather detracts from its efficacy as an anodyne in these cases. This objectionable feature may be avoided by combining the deodorized tincture of

opium in moderate doses with either chloral or the bromide of potassium.

Where these various remedies prove unsuccessful, the cold-water coil will invariably afford relief, and has in addition a decidedly beneficial effect upon the inflammation.

If the patient sleeps upon a hard bed, with a knotted towel applied about his waist in such a manner that he cannot comfortably lie upon his back, painful erections are not so apt to occur.

Morphia is sometimes necessary, and is best given by suppository, plain or in the following useful combination:

℞ Morph. sulph., gr. $\frac{1}{12}$.
Ext. hyoscyami, gr. ½.
Camphor. monobrom., gr. v.
M. Ft. suppos. No. 1. Sig.: At bed-time.

The remedies most relied upon in the treatment of gonorrhœa are the various balsamic preparations. These should not usually be given during the increasing stage of the disease, and it would seem that more marked benefit is to be derived from them when they are not used early in the case. There is, perhaps, no objection to the administration of the oil of sandalwood in the increasing stage; cubebs and copaiba, however, are more stimulating, and consequently inadvisable at this time. Sandalwood is best administered in the form of capsules containing from ten to fifteen minims; of these, from four to ten may be

given daily. In lieu of the capsules the pure oil may be given, placing ten or fifteen drops upon a lump of sugar, the dose being repeated four or five times daily. The limit of tolerance is usually heralded by stomachic disturbance, or quite frequently by pain in the back resembling lumbago—probably a nephralgia dependent upon over-stimulation and consequent irritation of the kidneys. Sandalwood is much more likely to produce this result than are copaiba and cubebs. During the stationary and declining stages copaiba and cubebs may be given alone or in combination. Of these two drugs, cubebs is the more stimulating to the mucous membrane of the urethra, but not so irritating to the stomach. Copaiba exerts an occasional unpleasant effect in the form of an efflorescence or rash upon the skin—sometimes so pronounced as to be not unlike measles; the cause of this action is not known, though it appears to bear some relation to idiosyncrasy, an impression being made by the drug upon the sympathetic nervous system analogous to that produced in some individuals by eating shell-fish, over-ripe tomatoes, etc. Quinine and several other drugs have been observed to produce a similar reaction of the skin, probably in the same way. It is possible that defective renal elimination has something to do with these cases.

Cubebs and copaiba may be given in doses of ten to twenty drops, four or five times daily, either in capsules or in the form of an emulsion; I prefer the

emulsion where the patient does not object to it. The dose of the balsams may be increased to the limit of tolerance, but it is wise not to give them too liberally until the disease begins to decline. There are no better combinations in the way of balsamic emulsions than the following:

℞ Liq. potassii, ʒ iv.
Bals. copaibæ, ℥ j.
Ol. gaultheriæ, ♏ x.
Fluid ext. glycyr., ℥ ss.
Muc. acaciæ, q. s. ad ℥ iv.

S.: ʒ j every two or three hours.

℞ Ol. cinnamomi, ♏ x.
Ol. cubebæ, ℥ ss.
Sp. æther. nit., ℥ ss.
Muc. acaciæ, q. s. ad ℥ viij.

M. Sig.: ℥ ss three or four times daily.

Cubebs may be given in powder form in doses of one drachm, two or three times daily, and this form sometimes agrees with the stomach very much better than either the emulsion or capsule. The formulæ given are more or less illustrative, and may be varied according to the judgment of the practitioner. Vidal advocates the use of gurjun balsam in doses of two grammes before each meal. Dr. R. W. Taylor speaks favorably of the tincture of *Cannabis sativa* in doses of ten to fifteen drops in water, three or four times daily.

In the later stages of gonorrhœa in which there is a tendency to chronicity, turpentine is occasionally

of value, the white or Canada turpentine being the best variety. I have obtained benefit in some cases from the administration of the following:

℞ Terebinth. alb., gr. ij.
Res. podoph., gr. $\frac{1}{64}$.
Camphor. monobrom., gr. ij.
M. Ft. pil. Sig.: One four times a day.

In some instances in which the patient is debilitated, the addition of iron to the balsamic preparations is advisable for its tonic and astringent effect. (Caps. ferri cum copaibæ.) Matico and other vegetable preparations containing tannin are recommended for internal administration, but I have failed to note any benefit from these drugs, with the possible exception of *Hydrastis canadensis*, which has seemed to be of service in some cases of chronic urethritis.

The beneficial effect of the balsams when administered internally is rather peculiar, inasmuch as when locally applied by means of injection they have apparently no action whatever. It would appear that in their passage through the economy they undergo some chemical change, by virtue of which they exert a special soothing effect upon the inflamed mucous membrane. That they exert any specific (microbicidal) influence over the poison of virulent urethritis is highly improbable. Their effect is certainly not constitutional, as they are of absolutely no service in gonorrhœa in the female, unless the urethra is involved.

The local use of copaiba does not seem to be beneficial; nevertheless it has been recommended in vaginitis. M. Bàratier* advises the use of copaiba and extract of opium in the form of vaginal suppositories for gonorrhœa in the female. Inasmuch as this is said to cure "in about twenty days," it is hardly necessary to comment upon it as a means of specific medication, for certainly a remedy which would not bring about a cure in less time than this can hardly be said to be very efficacious as a specific.

The test has been made by M. Ricord and others of injecting into the inflamed vagina and urethra the urine of patients who were taking large quantities of copaiba; the effect was decidedly beneficial.

Raquin, of Paris, has prepared a solution termed by him "copaibate of soda," which is said to be useful as an injection as well as internally.

Aperient medicines are beneficial throughout the course of urethritis, particularly during the acute stage. The saline laxatives are especially beneficial; the various natural mineral waters, notably the Friedrichshall and Hunyadi Janos, being the best of these. The Carlsbad salts are also of service. It should be remarked in this connection that constipation is invariably attended with more or less congestion of the prostate, and possibly of the urethra, and its removal is therefore desirable. Bruising of the

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* Thèse de Paris.

prostate during a difficult stool may constitute the point of departure for prostatic complications in the course of acute urethritis.

Naphthol is a remedy recently recommended in urethritis. This agent is claimed to act by becoming decomposed and thereby converted into some modification of phenol (or carbolic acid), which, coming in contact with the mucous membrane of the genito-urinary tract, is supposed to destroy the germs of disease. It has been given in doses of from two or three to fifteen grains, several times daily. It would appear to be indicated in chronic vesical inflammations rather than in urethral troubles, inasmuch as it probably makes the urine less putrescible. It is apt to disturb the stomach, and, as the process in gonorrhœa is an active mixed infection rather than a septic process, I cannot appreciate its advantages over some other drugs.

LOCAL MEDICATION.

Local medication in acute urethritis is best accomplished by means of injections.

A great deal of discussion has been evoked regarding the advisability of the injection method of treatment in gonorrhœa. A deep-grounded, and in many instances it must be confessed justifiable, prejudice against injections is entertained by the laity, and incidentally by some surgeons. It is supposed by many that the injection method is usually responsible

for stricture and other untoward complications and sequelæ of urethritis. While, doubtless, this prejudice is not always without foundation, yet I venture to assert that it is the abuse and not the use of injections that is responsible for their unpleasant results. Injections of simple water, if improperly used, may produce injury, and it is certainly true that unreasonably strong astringent or antiseptic drugs will, upon the average, produce unpleasant results. Any injection of a strength sufficient to produce severe pain is probably also strong enough to destroy the already partially devitalized epithelium upon the surface of the mucous membrane, and as a consequence there must necessarily occur at various points localization and intensification of the inflammatory process. Given at the proper time and in a proper manner and strength, injections are not only harmless, but very beneficial and actually prophylactic of stricture and other complications, by limiting the severity and duration of the inflammatory process. Any system of injections which is given for the purpose of cutting short the disease during the height of the inflammation is apt to produce injurious results. It is unfortunate that many surgeons have chimed in with the popular prejudice against injections, for, as a consequence, nearly every patient who has stricture resulting from a gonorrhœa which has been treated by the injection method, no matter how skillfully and beneficially, attributes the permanent injury of the canal to the treatment of his

urethritis; should he consult a surgeon of anti-injection proclivities, he is certain to have his erroneous ideas confirmed, much to the detriment of the reputation of his former surgeon, who perhaps treated his urethritis upon strictly scientific and conservative principles.

One of the most important points in connection with the injection method of treatment is the selection of an appropriate syringe. The ordinary glass syringe, or the hard rubber syringe with a long nozzle, is perhaps responsible for more prolonged cases of urethritis than any that could be mentioned. The introduction of such instruments, even when performed very carefully, invariably excites more or less mechanical irritation, and it is not unusual to detect in long-standing cases a congested and granular patch of mucous membrane precisely at the spot upon which the nozzle of the syringe has impinged during injection. Very few surgeons devote much attention to the instruction of the patient in the proper use of the syringe, or to the selection of an appropriate form of this instrument. I have seen not a few cases of chronic urethritis which subsided immediately upon the cessation of the use of faulty syringes. In some cases a cure will result from the use, with a proper syringe, of the same astringent solutions which have failed to produce any effect whatever when used with one of the long-nozzled abominations. The best form of syringe is that with a conical point, known as the "Excelsior-P," manufactured by the Goodyear

Rubber Company. The instrument must be of moderate capacity in order to accomplish any benefit, for if it does not contain sufficient fluid to thoroughly distend the urethra when thrown into the canal with a moderate degree of force, the medicament is never brought in contact with the entire diseased surface.

Fig. B.—Excelsior-P Syringe.

In using the syringe, the patient should be instructed to urinate first, thus clearing away the purulent secretion as far as possible, and then to inject the fluid slowly and steadily. Too great or spasmodic force is liable to drive the fluid—and with it, germ infection—into the deep urethra and produce prostatic, vesical, or testicular complications.

During the increasing stage of urethritis, injections should be very mild—indeed, they may usually with advantage be dispensed with altogether at this time. A solution of bichloride of mercury in a strength of from 1:30000 to 1:15000, in combination with a small amount of glycerin, is about the best routine injection for use at this period. The majority of cases appear to be materially benefited by it, while in others it will be found to be too irritating and, temporarily at least, harmful. Even in the cases in which it is beneficial it appears to lose its effect in from two

or three to ten days, when it becomes necessary to substitute for it some of the ordinary astringents in mild solution. I presume that its evil effects are due to its peculiarly destructive influence upon the epithelium. It is always more markedly beneficial in simple urethritis.

It has sometimes occurred to me that astringents often serve to prevent the normal evolution of urethritis by condensing the tissues and sealing up—so to speak—the avenues of germ elimination.

In lieu of the bichloride injection during the increasing stage, an anodyne injection may be given, the following being useful formulæ:

℞ Atropiæ sulph., gr. ij.
Bismuthi subnit., ʒ iv.
Muc. acaciæ, ℥ ij.
Aquæ dest., ℥ ij.

M. Sig.: Shake well, and inject three times daily.

℞ Tr. opii deod., ʒ ij.
Bismuthi subnit., ʒ iv.
Muc. acaciæ, ℥ ij.
Aquæ dest., ℥ ij.

M. Sig.: Shake well, and inject three times daily.

℞ Morph. sulph., gr. viij.
Cocaine, gr. iv.
Muc. acaciæ, ℥ j.
Aquæ dest., q. s. ad ℥ ij.

M. Sig.: Inject three times daily.

There is no objection to the use of a mild and sedative astringent in combination with the anodynes:

℞ Plumbi acetat., gr. iv.
Vini opii, ʒ ij.
Aquæ rosæ, q. s. ad ʒ iv.

M. Sig.: Inject.

℞ Sodii biborat., gr. xx.
Morph. sulph., gr. vj.
Aquæ rosæ, ʒ iv.

M. Sig.: Inject.

In the stationary stage the strength of the astringent injections may be slightly increased. It would appear that it is not so much the form of the astringent as the method of its use that determines the beneficial effects. It will be found that a number of different astringents give about the same average results when properly used, although in some cases it will be necessary to vary them. The most popular astringent drug is zinc sulphate, and this will be found beneficial in quite a large proportion of cases. Personally, I prefer the sulpho-carbolate or iodide of zinc to the sulphate. Silver nitrate in a strength of one-eighth to one-half a grain to the ounce of water is often of great service; some recommend it as the best routine injection.

The following illustrative combinations will be found useful:

℞ Zinci sulphat. (or acetat.), gr. xij.
Morph. sulph., gr. x.
Glycerinæ, ʒ j.
Aquæ rosæ, ʒ iij.

M. Sig.: Inject.

℞ Zinci sulph. carb., gr. xvj.
Glycerinæ, ʒ j.
Aquæ rosæ, ℥ iij.

M. Sig.: Inject.

℞ Zinci iodidi, gr. viij.
Ac. carbol., gr. iv.
Aquæ dest., ʒ iv.

M. Sig.: Inject.

The acetate of lead is also a serviceable astringent.

℞ Plumbi acet., gr. xx.
Tr. opii, ʒ ij.
Aquæ rosæ, q. s. ad ʒ iv.

M. Sig.: Inject.

Vegetable astringents are often to be preferred to mineral. Matico, hydrastis, catechu, kino, and like drugs are very popular; their virtues depend upon the tannic acid they contain. The muriate of hydrastine is especially popular and very often efficacious A favorite vegetable astringent in my practice is the fluid extract of *Hamamelis virginica*. The following formula has proved of great service:

℞ Hydrastine mur., gr. x.
Ext. hamamelis, fl., ʒ ij.
Glycerinæ, ℥ j.
Aquæ dest., q. s. ad ʒ iv.

M. Sig.: Inject.

As the inflammation begins to decline, the strength of the injection selected may be increased,

sometimes to double the proportions given. This should be done very cautiously, however, and in no instance should an injection be continued when it is found to produce considerable pain. Nothing more than a slight smarting is warrantable. In some cases the use of the injection does not produce much discomfort, but it will be found that smarting during micturition increases; under such circumstances, either the strength of the injection should be diminished or some other form of medicament substituted. This proposition is especially pertinent as applied to injection of mercury bichloride; it will be found that with this drug in a strength of even one-sixteenth of a grain to the ounce, patients will complain in a day or two, not of pain following the injection, but of severe smarting in micturition.

Sulphate of thallin is often of service in a strength of twenty grains to the ounce of rose-water.

Iodoform has been used to a considerable extent in the treatment of acute urethritis, but, as far as my experience goes, it does not seem to be superior to, or even as efficacious as, many other drugs, and its disagreeable odor more than counterbalances any possible beneficial effects. In the chronic forms of the disease, however, it may be used with advantage, if the patient can be induced to disregard its tell-tale odor.

A form of treatment which has been highly recommended is the insertion of soluble bougies of

various types of medication. I am satisfied that this method of treatment is not only illogical, but very injurious, in acute urethritis, for any suppository of sufficient stiffness to permit of its introduction into the urethra is capable of producing mechanical irritation. As an additional objection, there is no form of soluble bougie which can be practically applied by the majority of patients. There exists, also, the not inconsiderable danger of exciting inflammation of the deep urethra, prostatic and vesical complications, and epididymitis. The bougies have seemed to me responsible for these complications in several cases which I have seen in consultation, and in experimenting with them in my own practice I have had on several occasions unfortunate results. It is certainly impracticable to combine germicide drugs with the bougies in sufficient strength to completely neutralize the virus of the disease, and inasmuch as the bougie necessarily carries with it more or less of this poison into the deeper portion of the canal, it is obvious that an extension of the inflammation is apt to result. I do not wish to be understood as absolutely condemning the use of soluble bougies, for in the chronic forms of urethritis they are often of service. It must be confessed, however, that even in these cases the bougie is of benefit chiefly through a primary increase of irritation of the canal, as a consequence of the mechanical stimulation which it produces. In my practice, therefore, this form of medication is mostly

confined to exceedingly chronic cases in which I consider it necessary to "wake up," so to speak, the mucous membrane.

One of the most popular modern methods of treatment of urethritis is by retro-injection of hot water or antiseptic solutions through a soft rubber catheter or some of the various forms of tubes devised specially for this purpose. Many who have tried this method are very enthusiastic in its praise, but I am free to say that they must have a knack in the application of the method, which I have been unable to acquire, or my patients are characterized by very sensitive urethræ. I find that the method is open to the same objections as the soluble bougies, for in the introduction of the tube more or less of the virus is carried into the deeper portions of the canal, and it is questionable whether the injection fluid can be safely given in a sufficient strength to neutralize this. More or less mechanical irritation is induced, and this in very acute cases is likely to be productive of injury. I will qualify this statement by admitting that in certain cases which exhibit a tendency to chronicity the irrigation method is decidedly beneficial.

Fig. C —Retrojector for Deep Irrigation of the Urethra.

Professor E. R. Palmer,* of Louisville, is very enthusiastic in his advocacy of the retro-injection method. Dr. Brewer,† of New York, has written upon this method quite extensively. In a spirit of fairness I desire to present the latter gentleman's conclusions, which are as follows:

"1. That in uncomplicated cases of gonorrhœal urethritis, treated by prolonged and frequent irrigation with bichloride of mercury, recovery may be expected within two weeks; *that this period may be considerably shortened by the early inauguration of treatment, by absolute rest, and by the avoidance of stimulants; that it may be indefinitely prolonged by irregularity in treatment, by inordinate physical exertion, and by indulgence in alcoholic and venereal excesses.*†

"2. That the retro-injection method with a hot solution of bichloride possesses all the advantages of the former procedure, and in addition causes a more rapid subsidence of the inflammatory symptoms, a greater feeling of comfort to the patient, and is attended with less annoyance and trouble.

"3. *That in cases of acute non-specific urethritis the favorable influence of each of these methods is strikingly apparent.*‡

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*American Practitioner and News, 1887.

† Journal of Cutaneous and Venereal Diseases, May, 1887.

‡ Italics mine.

"4. That in cases of chronic purulent urethritis no agent produces such rapid and permanent improvement as irrigation, especially when combined with astringents and heat.

"5. That the percentage of complications occurring in cases treated by these methods is far below that observed when the ordinary methods are employed."

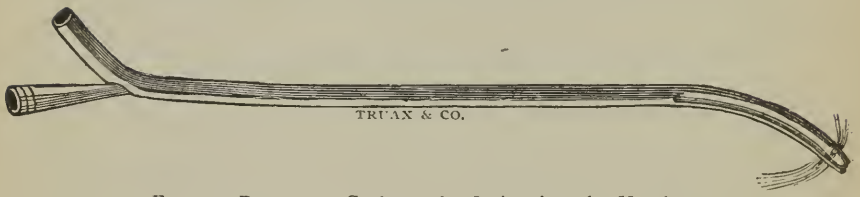

FIG. 1.—Recurrent Catheter for Irrigating the Urethra.

The solution used in the retro-injection method should be of a strength of 1: 20,000, or even weaker, and applied as hot as can be borne.

Dr. Keyes* has tried the method of irrigating the urethra with hot bichloride solutions, and has apparently failed to become impressed with their value. He concludes that: (1) A mild bichloride solution irritates the mucous membrane of the urethra more than it seems to irritate an open wound. (2) It appears that an abortive method of treatment of gonor-

FIG. 2.—Open-end Soft Catheter for Urethral Irrigation.

*Journal of Cutaneous and Venereal Diseases, March, 1884.

rhœa is yet to be discovered. (3) The hot-water treatment of gonorrhœa is unreliable.

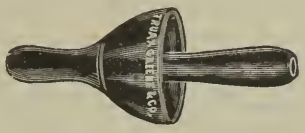

Fig. 3.—Lydston's Nozzle for Urethral Irrigation.

I have found that a soft, open-ended catheter is as useful as anything for deep irrigation of the urethra. Under ordinary circumstances a short nozzle is

Fig. 4.—Glass Irrigator.

sufficient. This is to be used without a tube, and has a concave shield to catch the return flow. I invari-

ably use the fountain syringe or the irrigator shown in Fig. 4. There are several varieties of injection tubes which are more or less useful.

Fig. 5.—Soft Tube for Injecting the Urethra.

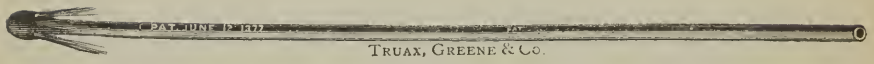

Fig. 6 —Mitchell's Urethral Injection Tube.

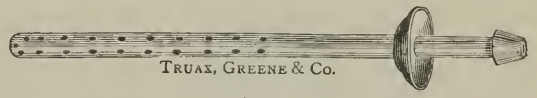

Fig. 7.—Otis's Syringe-Nozzle.

The latest fad in the treatment of urethritis is what is termed the *dry method*, and consists in the introduction of dry antiseptic powders into the canal through a special and patented device. This method is open to the same objections as is the use of soluble bougies and retro-irrigation in acute gonorrhœa. It is apt to be of service, however, in less acute forms of the disease.

It is not my purpose to attempt to present all of the various methods of treatment and specifics that have been recommended for urethritis. This would be an onerous as well as unprofitable task. The list of "specifics" recommended runs up well into the hundreds.

After a survey of the various special methods of treatment, Mr. Milton draws the following apt conclusions:

"1. That all the remedies yet enumerated, though adequate to cure by far the greater number of cases, still leave many unrelieved.

"2. That while many are undoubtedly valuable, some of them are disagreeable, some dangerous, and some superfluous.

"3. That there are no rules to guide us in distinguishing at the outset those cases which are amenable to these remedies from those which are not.

"4. That when so large a list of remedies is given, more time ought to be allowed to decide with accuracy in what cases each remedy should be tried; which, as yet, has never been done, so that every cure obtained is only an additional source of confusion.

"5. That the reputation of injections has been injured by the want of any certain rules as to the relative value of the different substances employed, and the strength requisite in different cases; thus leading to the indiscriminate application of different substances in solutions of the same strength on the one hand, and, on the other, to the equally indiscriminate application of injections of the same strength to cases not equally fitted to bear them.

"6. That the treatment has been made secondary to the nature, source, and history of the disease, and speculations—for they deserve no better title—on the

action of medicines; whereas the cure of disease ought to precede all other considerations. For whatever may be the value of science, the welfare of man is a still greater object.

"7. That, rash as such an opinion may seem, I do not fear to say that *I doubt whether man will ever discover drugs superior in power, for this disease, to those we already possess*, and that there is accordingly more to be hoped for by trying to improve the administration of medicines already known to us than in seeking for new remedies."

Blistering the penis and perineum by means of cantharidal solutions is a favorite remedy for acute gonorrhœa with some surgeons. Milton, in particular, favors this method of treatment, but applies the blister in the form of cantharidal plaster wrapped about the penis. I have found that most patients object to fly-blisters, and have compromised by applications of the tincture of iodine along the course of the urethra, with apparent benefit. Milton recommends what he terms "a caustic plug" in the treatment of obstinate cases of gonorrhœa. This consists of a strip of linen, saturated in a solution of silver nitrate, five grains to the ounce, and inserted into the urethra through a tube similar to an endoscope, which is then removed, the cloth being allowed to remain until it comes away with the urine.

CHAPTER VIII.

TREATMENT OF CHRONIC URETHRITIS.

The treatment of chronic urethritis requires more radical measures than are warrantable in the acute stages of the affection, and incidentally a greater variety of remedies, these being necessitated by the varying character of the special causes which tend to the perpetuation of the inflammation.

The first step to be taken is to explore the urethra, and thus determine, if possible, what particular local condition is keeping up the difficulty. Ordinarily the bulbous flexible French bougies will be found sufficient for this purpose, for in the majority of instances we need only to know of the existence of a localized spot of inflammation or stricture, ocular inspection being of little or no advantage. In the hands of the expert the bulbous bougie readily determines with a great degree of accuracy the condition of the urethra.

FIG. 8.—Bougie à Boule.

Otis's acorn-tipped metallic sounds may be used, but I prefer the soft instrument.

The endoscope bears a somewhat similar relation to urethral exploration that the stethoscope does to the diagnosis of disease of the thoracic viscera. The

physician who becomes expert in physical diagnosis finds that the unaided ear is all-sufficient for practical purposes in the exploration of the chest, the stethoscope becoming necessary only in very obscure cases,

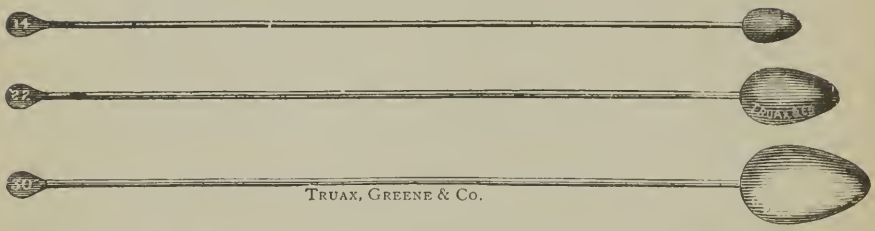

FIG. 9.—Otis's Bulbous Sounds.

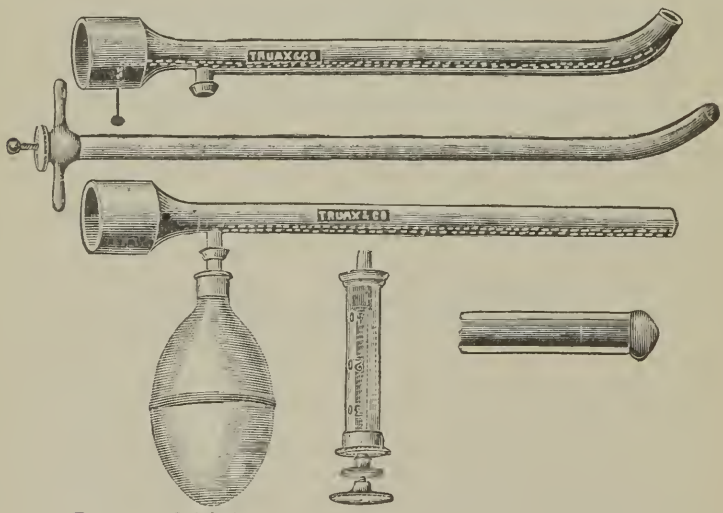

FIG. 10.—Otis's Urethroscope and Deep Urethral Syringe.

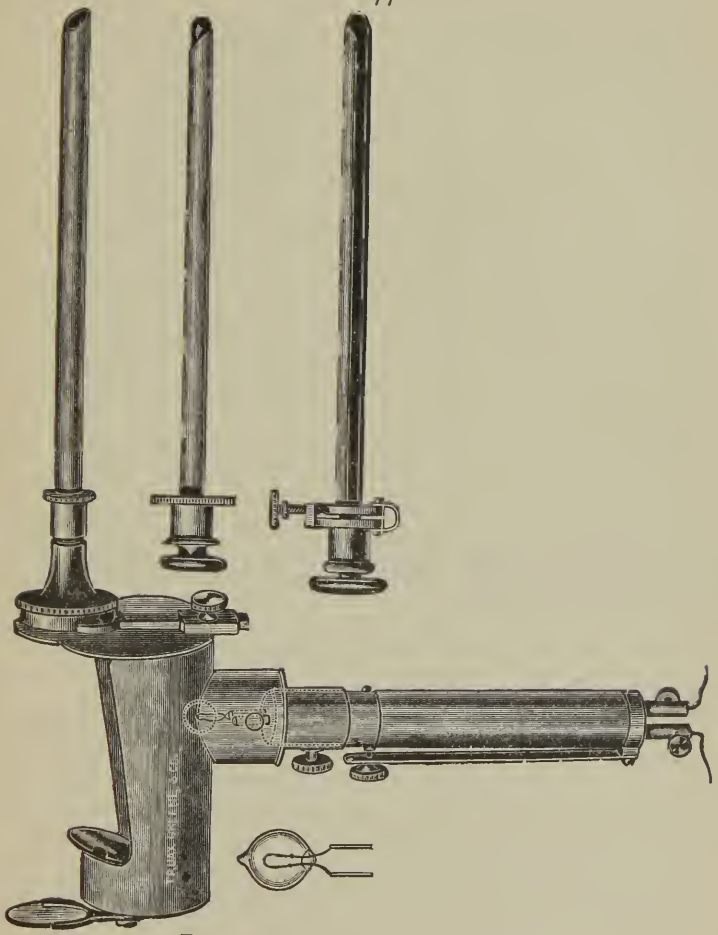

FIG. 11.—Leiter's Panelectroscope.

or those in which critical and hair-splitting differentiation of objective signs becomes necessary. There have been numerous elaborate endoscopes devised, but for practical purposes the ordinary straight hard-rubber or silver tubes, with the addition of a strong light reflected from a laryngoscopic reflector, or from one of the modern small reflecting electric lamps, are sufficient. The panelectroscope of Leiter is valuable where it is practicable to utilize it. I find that my own tubes, which are much larger than Leiter's, are more useful than the latter in most cases in which I use the panelectroscope. It is well to have a series of these tubes in order that an instrument may be selected which is as large as the capacity of the urethra will admit. In case stricture exists, preliminary dilatation is almost always practiced prior to endoscopy, and it thus becomes possible to use relatively large tubes for explorative purposes. The mistake is often made of having these tubes too long. By crowding the penis well down around the tube, a short tube can be used much more effectively than the longer variety.

We will first consider those cases the chronicity of which depends chiefly upon constitutional conditions or a general predisposition to catarrhal fluxes of various kinds, and in which exploration fails to detect any local condition as a sufficient explanation of the discharge. Cases frequently arise in which all forms of internal and local treatment fail of their object be-

cause the surgeon does not appreciate the constitutional peculiarities of his patient. Feeble and strumous subjects, and those who are debilitated from any cause whatever, require the administration of tonics, such as quinia, iron, cod-liver oil, and various preparations of nux. In cases of this kind, tincture of iron chloride or the mineral acids sometimes accomplish wonderful results by improving the general systemic condition, toning up the relaxed and flabby mucous membranes, and inhibiting excessive secretion. It is in these cases, too, that we are apt to have excellent results from the internal administration of vegetable astringents, ergot, etc.; turpentine in moderate doses is occasionally of decided advantage; tincture of cantharides may also be of service.

FIG. 12.—Otis's Endoscopic Tube.

Local measures of treatment are often unnecessary. In fact, it will be found that in just such patients the prolonged use of injections and balsamic preparations is inclined to perpetuate, rather than cure, the gleet. In some instances, however, in conjunction with measures to improve the general health, it will be found advantageous to make local applications. One of the best that I have tried is the pure

fluid extract of hamamelis, applied by a cotton-wrapped probe *via* the endoscopic tube. This will never be found to be too strong, and it is a singular circumstance that patients who are unable to bear an ordinary injection of hamamelis in 25-per-cent. aqueous solution make no complaint of the application of the pure fluid extract in this manner. I sometimes find it necessary to alternate with an ointment of silver nitrate of ten grains to the ounce, in combination with stramonium or belladonna, by means of the cupped sound; tannin may be used in the same manner.

In making all these applications the patient should first be directed to urinate; a full-sized sound should then be passed to press out the contents of the dilated follicles of the urethra, after which the medicated application is made.

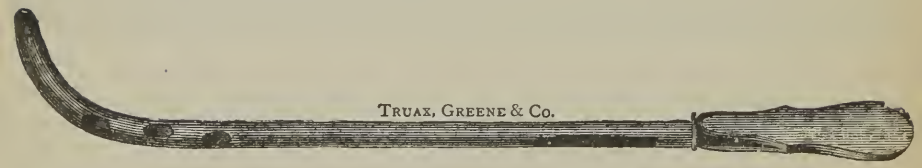

Fig. 13.—Van Buren's Cupped Sound.

A plan which has proved efficacious in some instances is the prolonged use of hot water in combination with lead acetate, the patient being instructed to inject the urethra for fifteen or twenty minutes, night and morning, with water as hot as can be borne. The

treatment is to be concluded by syringing the canal with a mixture of fifteen drops of a saturated solution of lead acetate in an ordinary teacupful of hot water, thrown into the canal four or five times in succession. In a few instances of catarrhal gleet I have succeeded in checking the discharge by the use of a watery solution of ordinary alum, in the strength of a drachm to eight ounces, night and morning.

It may be considered absurd to advocate a change of climate for patients with this form of chronic urethritis, yet when other conditions seem to demand it this plan may be advised, and will be found to be productive of marked benefit.

The rheumatic, gouty, syphilitic and tubercular diatheses will be found to be responsible for some cases of chronic urethritis. These conditions require the same remedies as under other circumstances; the combinations of mercury, potassium iodide, and colchicum are apt to be particularly serviceable in the three first-named. The various balsamic preparations may be continued during the course of treatment for chronic urethritis, providing the stomach and kidneys tolerate them.

Stricture of the urethra is the most frequent cause of chronic urethritis. Its treatment is beyond the scope of this work.*

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* The author's views upon this subject will be found in a monograph on "Stricture of the Urethra." M. H. Kauffmann & Co., Chicago.

Congested and granular patches require local applications by means of the endoscopic tube. It should be remembered in this connection that general and powerful applications to the canal are apt to be productive of injury. It is unfortunate that the surgeon seldom localizes his efforts to cure the complaint, but continues the use of caustic and astringent applications, "shot-gun" fashion—sometimes hitting the disease, but more often the normal membrane,—and the internal administration of the balsams, in a futile effort to relieve something that perhaps a single well-directed application would cure. It is necessary to determine the precise location of the offending spot and to accurately measure its distance from the meatus, with or without ocular inspection of the part. The passage of a steel sound upon alternate days for a few weeks will cure a large proportion of these cases by crushing the minute granulations, emptying pus-distended follicles, producing local absorption of the infiltrated material in the mucous membrane, toning up the latter, and stimulating repair. When this method of treatment has been found to be ineffectual, strong applications of silver nitrate or copper sulphate may be made directly to the diseased spot *via* the endoscope. The pure crayon of copper sulphate or silver nitrate is safe, if very cautiously used. The silver may be fused upon the end of a blunt probe and touched to the spot very lightly. In lieu of the pure caustic, strong solutions

of copper or silver may be used, thirty to sixty grains to the ounce being admissible, but great care is necessary not to leave an excess of the caustic fluid upon the mucous membrane. When the diseased point is within three inches of the meatus, the urethral speculum is often serviceable in making applications. The

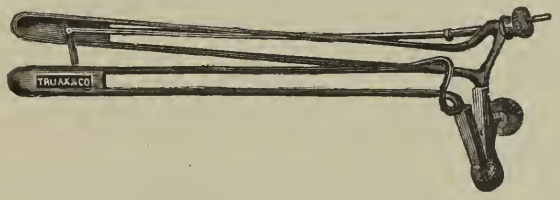

Fig. 14.—Brown's Urethral Speculum.

meatoscope may also be useful. It is in cases of chronic urethritis that the methods of treatment by soluble bougies and retro-injection are apt to prove of the greatest service.

Fig. 15.—Weir's Meatoscope.

About the oldest method of treatment of gleet consists in the injection of astringents of gradually increasing strength. Ricord's old formula provided for the injection of one part of red wine to three of water, each syringeful of the injection being replaced in the bottle by wine, so that after a time the patient

was using pure red wine. Bumstead speaks highly of strong solutions of the persulphate of iron.

Experience has shown that many cases of urethritis are perpetuated by a contracted meatus, behind which urine and inflammatory products accumulate and produce irritation. It is advisable, as a matter of routine, to perform meatotomy in every case of chronic urethritis in which the meatus will not admit a full-sized sound. The incision should be made with a straight, blunt-pointed bistoury, and kept open by the frequent introduction of a short sound or a fossal bougie.

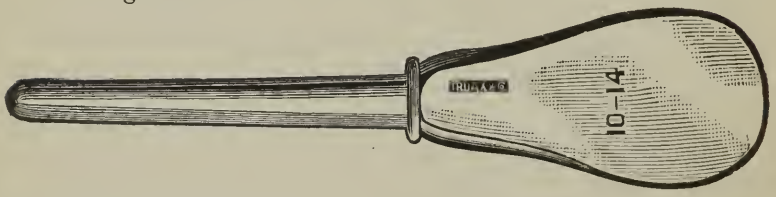

Fig. 16.—Piffard's Fossal Sound for Dilating the Meatus.

In some cases of gleet, dependent upon congested and granular patches of mucous membrane, there exists a slight thickening of the underlying mucous membrane, hardly of sufficient importance to be denominated a stricture, yet requiring the same treatment, and eventually terminating in a constriction of the lumen of the canal. These patches of tough and resilient infiltration are usually found in the pendulous portion of the urethra, and in such cases the gleet is

absolutely resistant to all measures of treatment, until a urethrotomy is made and the thin layer of thickened tissue divided. When this process extends entirely around the circumference of the canal, it necessarily constitutes a stricture of large calibre; but it is well to remember that even though no pronounced narrowing of the canal is evident, the relation of the thickened tissue to the gleet is precisely similar to that which obtains in the case of an acknowledged stricture. It is to be remembered, furthermore, that in many cases denominated "stricture of large calibre" there is really not a strictured condition of the canal, but as the instruments pass over a thickened, granular and hyperæsthetic patch there occurs, just at the

Fig. 17.—Lewis's Urethral Applicator.

location of the pathological process, spasm of the accelerator urinæ and compressor urethræ muscles, which give rise to the same objective symptoms as stricture. I dare say that urethrotomy is performed many times for the relief of strictures of large calibre in which true organic stricture does not exist, and there is only the condition of affairs just described to explain the obstruction to the introduction of imple-

ments and the grasping of the bulbous bougie as it is withdrawn from the canal. This fact, however, does not prove that there is no necessity for urethrotomy.

A very ingenious instrument for the treatment of gleet is the ointment-applicator of Bransford Lewis. A threaded cap and a box with a female screw are

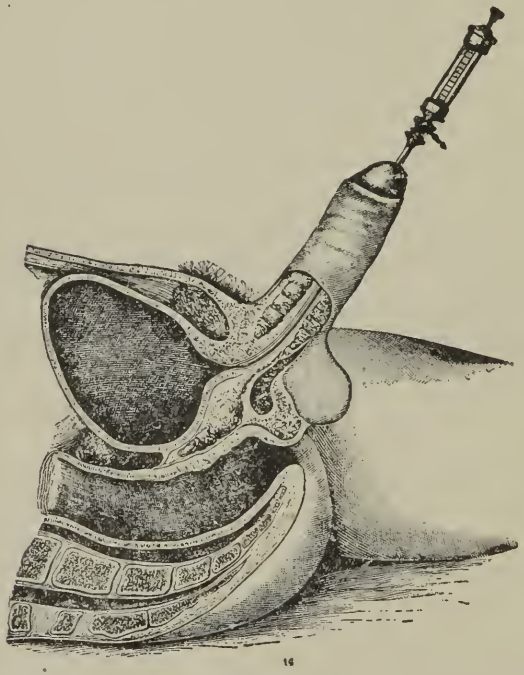

FIG. 18 —Method of Deep Urethral Injection. (After Finger).

attached to a urethral tube. The box being filled with ointment, the instrument is inserted into the urethra and the cap screwed home, thus ejecting the ointment.

In a few cases of chronic gleet I have obtained marked benefit by the use of astringent sprays thrown through the endoscopic tube by means of an ordinary Sass spray apparatus, in alternation with applications of an impalpable powder of equal parts iodoform, boracic acid, and camphor, administered by means of the powder-blower.

When the inflammatory process has localized itself in the deep or prostatic urethra—posterior urethritis,—injections by means of the deep urethral syringe are absolutely necessary. The instrument of Ultzmann, or its modifications, may be used for this purpose. I have devised a more capacious syringe

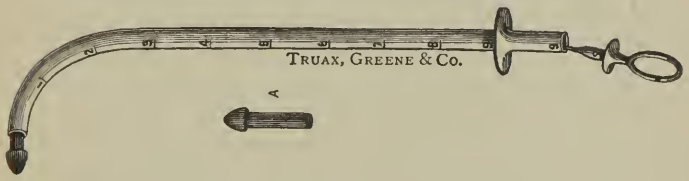

FIG. 19.—Mitchell's Application for Medicating the Deep Urethra with Soluble Bougies.

than that of Ultzmann, which I prefer to any I have seen. Nitrate of silver, sulphate of copper, and sulphate of thallin are the best drugs for use in these cases. Soluble prostatic bougies and astringent ointments are occasionally of great service.

As far as my own experience goes, I have found the sulphate of thallin in a 15- to 20-per-cent. solution the best antiseptic and astringent application for routine use in posterior urethritis. My usual plan is to alternate the thallin with solutions of silver nitrate in varying strength. In some cases in which there was chronic inflammation of the bulbous urethra I have succeeded in exciting healthy action by irrigating the canal with hot iodized water in a strength of one drachm to the pint. In quite a number of obstinate cases I have had excellent results from the use of a mixture of balsam of Peru, compound tincture of benzoin, and iodoform, *via* the endoscopic tube.

℞ Iodoformi, ʒ iv.
Tincture benzoini comp., ℥ j.
Balsam Peru, ℥ j.

M. Sig.: Apply.

The following is also useful applied in the same manner:

℞ Iodini resub., gr. xx.
Eucalyptol, ʒ ij.
Kalii iodid., ʒ ij.
Glycerin. tannat., ℥ ss.
Ac carbol., gr. xx.
Boro-glyceride, q s. ad ℥ ij.

M. Sig.: Apply.

All measures of treatment of chronic gleet will fail of their object if the surgeon does not advise his patient against various sexual, dietetic, and other gen-

eral causes of perpetuation of urethritis, and the patient does not follow these instructions to the very letter. Unfortunately, the average patient with gleet lays the responsibility of his case upon the shoulders of his surgeon, and expects him to accomplish a cure unaided. The capacity for deceit which the average patient with chronic urethral disease possesses, is something astonishing. It is certainly discouraging to have a patient present himself, we will say a month or six weeks after he has apparently been cured of stricture and gleet, with an acute or subacute urethritis, and solemnly vow that he has not played the glutton or *roué* during that time. It is possible that a few such patients do not lie to the doctor, but it would be difficult to convince the expert that, in the absence of an exciting cause, a canal which had been thoroughly dilated and the secretion of which had been entirely checked could spontaneously lapse into an inflammatory state at so long a period after an apparent cure. It is possible that patients with sexual difficulties are not more deceitful than those who present themselves for the cure of other affections, but my observation leads me to think they are. It is supposed that the average individual has sufficient respect for his own physical interests to be perfectly frank and honest with his physician, and it has been aptly said that "the man who deceives his doctor is a fool." But as far as my experience goes, I am constrained to believe that, if this proposition be true, imbecility is

largely prevalent in our community. Whether the moral turpitude of the venereal patient is due to a sense of shame, akin to that which impels him to apply the water-closet theory to the origin of his disease, or to a desire to lessen his financial responsibility to his surgeon, is a question that I am unable to answer. To say the least, it is safe to assume that there is no class of patients so aggravating, upon the average, as those met with in genito-urinary practice.

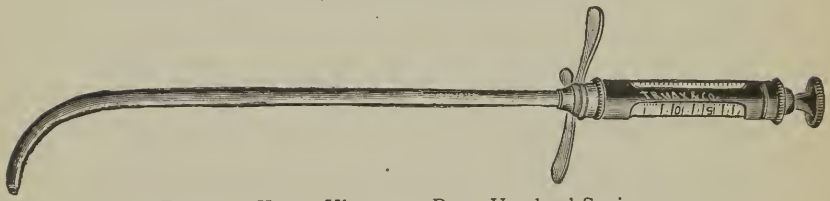

FIG. 20.—Keyes-Ultzmann Deep Urethral Syringe.

FIG. 21 —Hale's Sound for Applications to Deep Urethra.

CHAPTER IX.

TREATMENT OF THE COMPLICATIONS OF URETHRITIS.

SEVERE CHORDEE.

The danger of hæmorrhage is lessened by proper management of the chordee. This is best done by the administration of the anaphrodisiac remedies already recommended and the application of the cold-water coil or balloon rubber ice-bag. When severe bleeding does occur as a consequence of rupture of the corpus spongiosum from forcible straightening of the penis, it may be controlled in most instances by the cold-water coil; if, however, this is unsuccessful, a gum catheter may be passed into the urethra beyond the point of rupture, and the cold-water coil wrapped tightly around the penis; the injection of astringents into the canal may possibly become necessary if the hæmorrhage proves obstinate.

FOLLICULITIS AND PERI-URETHRAL PHLEGMON.

These, in by far the majority of cases, are best treated upon conservative principles. As soon as either complication manifests itself, injections and all stimulating methods of treatment should be stopped, and, if possible, the patient kept perfectly quiet. Hot applications will usually bring about resolution of the

swelling after a time. As a rule, the little tumors characteristic of folliculitis become absorbed; sometimes, however, they remain as small circumscribed indurations, and appear to keep up irritation. Extirpation is recommended by some authorities as a routine practice, under the supposition that the tumors inevitably suppurate, and that there is great danger of rupture into the urethra, followed by extravasation of urine, etc. I think, however, that, as a rule, when the inflammation of the urethra subsides to such an extent that the duct of the follicle becomes patent, the little tumor discharges its contents into the canal and the wall of the follicle eventually shrinks down to its normal size; this discharge of its contents is evidenced by the sudden increase in the urethral discharge. The follicles may refill and again discharge for an indefinite period, and cause a succession of reinfections of the canal. Should the swelling be marked or painful, or fluctuation evident, in peri-urethral phlegmon, an incision should be made at once; it is presumed the intelligent surgeon will know when to cut.

Conservatism is not so applicable in peri-urethral phlegmon in the perineal portion of the urethra as it is in cases involving the pendulous portion. When the perineum becomes hard and brawny, it is best to make an early incision, the operation being in itself harmless; and if an abscess has formed and opened into the urethra before the patient has come under observation, the case should be carefully watched

and free incisions made. If at any time a marked increase in the perineal swelling, chills, hectic, and general constitutional disturbance should occur, as evidences of new purulent foci or urinary infiltration, or if the swelling in the perineum is extensive and there is a disposition to the pointing of matter at any particular spot, external perineal section is required. In such cases a fistula results that is likely to heal spontaneously, but may require surgical attention later on.

RETENTION OF URINE.

The conditions producing retention are to be considered carefully in deciding upon its treatment. In a given case occurring in the course of the gonorrhœa, we must remember that the factors in its production are several, viz.: (1) Inflammatory swelling of the mucous membrane, and consequent diminution of calibre; (2) irritation produced by the acid urine; (3) prostatic congestion; (4) muscular spasm. In patients who have suffered from previous attacks there may be a stricture to which the foregoing factors are superadded. A prostatic abscess may be present, causing retention by simple pressure, immediately relievable by incision. The indications are plain. The case requires sedatives, derivatives, antispasmodics, alkaline diluents, and rest.

A full dose of morphia hypodermatically or per rectum, and a piping hot sitz bath, to be repeated as

occasion demands, are an immediate necessity. Ice in the rectum sometimes assists in relieving local congestion. Leeches to the perineum and anus are often very valuable. Hot drinks of demulcent infusions are of service as adjuvants. If abscess exists about the prostate, an incision is necessary.

An injection of cocainized oil into the urethra may be of service. The dread of painful micturition and the reflex effect of the irritating urine is often an important factor in the production of retention; this the cocaine may relieve. The catheter should be used only as a last resort. It is far better, in my opinion, to tap above the pubes than to use the catheter, other things being equal. If for any reason the catheter should be decided on, an anæsthetic should be given, although cocaine may be used locally and great gentleness exhibited in the passage of the instrument, the urethra having been first thoroughly and deeply flushed with a mild, warm, antiseptic solution; thus we may be able to avoid infecting the deep urethra and bladder. Personally I have found instrumental interference very rarely necessary.

PROSTATITIS.

Much of the treatment of prostatitis is embraced in the foregoing remarks anent retention of urine. Retention is very frequently due to prostatic congestion or inflammation. The same indications in a general way prevail in the treatment of prostatitis as in

retention in general. Anodynes, hot sitz baths, rectal applications of ice or frequent rectal irrigations with hot water, rest, alkaline diluents, bread-and-milk diet, and demulcent drinks, are about the range of therapeusis.

The patient should be particularly impressed with the necessity of rest—and prolonged rest. It is as absolutely impossible to cure prostatitis with the patient going about as it would be to secure union of a broken leg under similar conditions. Every step the patient takes bruises the enlarged and tender prostate.

The bowels should be kept free by salines and mercurials; unloading the portal circulation relieves pelvic congestion and pressure, and so benefits the inflamed organ.

Suppositories of iodoform are sometimes beneficial; they should contain anodynes such as morphia, belladonna, and hyoscyamus. The monobromate of camphor, per rectum, is often of service.

All treatment for the gonorrhœa *per se* should stop as soon as prostatitis develops, and should only be resumed with great caution some weeks after recovery from the complicating condition.

Leeches at an early period, followed by iodine or cantharidal blisters, are useful adjuvants in relieving congestion and producing counter-irritation. Should chronic prostatitis supervene, counter-irritation is of especial value. Electricity and deep urethral (*i. e.*, prostatic) injections are likely to become necessary.

So frequently do posterior urethritis, follicular prostatitis, etc., follow acute gonorrhœal inflammation of the prostate, that they are always to be suspected in cases of chronic urethral disease with an antecedent history of prostatitis.

COWPERITIS.

Cowperitis requires rest, the application of leeches, and the prolonged use of hot applications. Should the perineum become tense and brawny, or should there be severe pain or retention of urine, an incision should be made into the swelling without waiting for the formation of pus. If at the end of a week or ten days improvement does not occur, an incision is warrantable in any case. It will be found, however, that in many instances the inflammatory process will resolve without the formation of pus, particularly if the cellular tissue of the perineum is not extensively involved. Cowperitis is not always the result of a gonorrhœa. I have seen a typical case of the disease in a tuberculous patient, who had had no urethral difficulty; the trouble appeared to be due to a violent strain, and was probably not of a true tubercular nature, inasmuch as the cavity healed speedily and perfectly after incision, and no other foci of infection appeared. Even if allowed to break spontaneously, the pus in cowperitis usually appears externally; it may, however, open into the urethra and result in the formation of fistula or infiltration of urine, abscess, and sloughing.

TREATMENT OF ACUTE CYSTITIS.

The indications for treatment in this complication of urethritis are simple and exceedingly plain. Rest, a milk diet, anodynes per rectum, *per orem*, or hypodermatically, hot sitz baths, hot rectal irrigation, saline laxatives with or without mercurials, alkaline diluents, plenty of pure water, and demulcent drinks, comprise the principal therapeutic resources in this disease. Hot fomentations, turpentine stupes, or poultices over the hypogastrium, are often serviceable in general cystitis.

The range of drugs comprises such preparations as pichi, kava kava, uva ursi, cubebs, sandalwood oil, pareira brava, triticum repens, linseed, and slippery elm, in infusion or fluid extract. Some of these are only available in the form of infusion, others in fluid extracts. Acetate of potassium, citrate of potassium, benzoate of soda, liquor potass., salol, boracic acid, and salicylate of soda are all serviceable drugs for their antacid, antiseptic, and soothing effect upon the inflamed mucous membrane.

EPIDIDYMITIS AND ORCHITIS.

In some cases the application of a well fitting suspensory bandage at the first suggestion of tenderness of the testis is sufficient to ward off acute inflammation. As a rule, however, when the irritation once begins, inflammation develops.

Rest in bed is the first indication. The diet should be limited, and all treatment for the gonor-

rhœa suspended. There is no use in trying to bring about a cure with the patient going about; the issue may be averted for a few days, but the patient may as well go to bed first as last—he must surrender sooner or later in the vast majority of cases.

Anodyne poultices must be applied. These are best made of linseed meal and fine-cut tobacco in equal proportions, and may be sprinkled with laudanum. The object is to narcotize the testicle. The poultices should be applied very hot, and changed every two hours. The testicles should be supported upon a small pillow. Ice is recommended in lieu of the poultices, but in my experience is not reliable.

I have found the tincture of pulsatilla, in doses of ten drops every hour, very valuable in testicular inflammations. Dr. Piffard praises the same drug, but gives it in homœopathic doses.

As soon as the tenderness has in great measure disappeared, the testicle may be strapped. This procedure is rarely applicable before the fifth to the seventh day, but, if judiciously used, the patient may thereafter attend to business as usual. The straps should be removed and reapplied every second day.

The galvanic or faradic current, skillfully applied, will be found to hasten resolution of the inflammatory exudate in and about the epididymis. Should the effusion into the tunica vaginalis be excessive, it may be drawn off by aspiration or puncture with a tenotome—Vidal's method.

Severe and agonizing pain, associated with involvement of the body of the testis proper, demands subcutaneous section of the tunica albuginea testis.

In cases where a rheumatic or gouty habit exists, the iodides, salicylates and colchicum are useful. Diluents, alkalies and demulcents are indicated throughout. In lieu of the tobacco poultice I have found the following anodyne ointment to act well:

℞ Mentholis, gr. xx.
Ext. belladon., gr. xx.
Ext. opii, gr. xx.
Lanolini. ℥ ij.
M. Sig.: Apply on lint.

TREATMENT OF GONORRHŒAL RHEUMATISM.

This is not especially satisfactory, being palliative rather than curative. The treatment for the urethritis should usually be persisted in, for, as a rule, the sooner the local condition improves the sooner the rheumatic complications will yield. If, however, the discharge has ceased, it is best to let the urethra severely alone. When patients are debilitated, tonics, such as strychnia, quinine, iron, arsenic, and cod-liver oil, are of advantage. The skin and bowels should be kept active, and elimination favored by the use of pilocarpine hypodermatically. Pain should be relieved by the use of opiates; hot applications and fixation of the inflamed joint are essential for the same purpose. Should the knee be involved, Buck's extension apparatus should be applied as under ordinary forms of arthritis. The application of fifteen or twenty

leeches to the joint will prove serviceable. Flannels wrung out of hot water and sprinkled with turpentine form a useful application to the inflamed joint. As the inflammation subsides, blisters or iodine will be found to promote resolution. Mercury and potassium iodide internally are of great service in the chronic stage of the disease. In all cases the effect of the salicylates should be early tried, inasmuch as the rheumatic or gouty diathesis may exist as a predisposing cause. The more important joints, such as the knee, are best treated by the plaster-of-paris bandage as soon as the acute inflammation has subsided. Passive movement, and perhaps measures to break up ankylosis, are required in the later stages. Turkish and electric baths, static electricity, friction and massage are serviceable methods. Static electricity is particularly beneficial; I was much impressed with the value of this remedy in neglected cases of chronic enlargement of the joints, by observation of the results obtained at the New York Hospital for the Ruptured and Crippled, at the hands of Dr. V. P. Gibney and the late Dr. Knight. During the acute stage of gonorrhœal rheumatism a milk diet is very essential.

The ocular complications of gonorrhœa belong to the province of ophthalmology, and their treatment does not concern us here.

TREATMENT OF BUBO.

The slighter forms are curable by limiting move-

ment and applying iodine. In the more marked forms the patient should take to bed and apply every two hours hot linseed-meal poultices sprinkled with laudanum. The hot poultice is the best pus-preventer at our command. Should resolution not occur promptly, extirpation of the enlarged gland is indicated. If we operate aseptically before peri-adenitis and infection of the surrounding tissues has occurred, and close the wound accurately, healing is quite prompt. This may seem radical, but I am heartily sick and tired of the namby-pamby method of waiting for a bubo to suppurate and then waiting for weeks and months for it to heal. If prompt healing does not follow operation, the part is still in much better shape for subsequent granulation and cicatrization than if a distinct abscess were allowed to form.

TREATMENT OF BALANITIS AND VEGETATIONS.

Circumcision will avert balanitis in cases of redundant and phimosed prepuce. The man who allows himself to carry a long stenosed prepuce throughout life deserves all the venereal accidents that may befall him. In default of circumcision, absolute cleanliness may prevent balano-posthitis.

When the disease comes on, the indications are to keep the parts clean and dry. Astringents and antiseptic lotions and absorbent powders are useful. The iodide, sulphate or acetate of zinc, alum, bichloride of mercury, permanganate of potassium, and

many other drugs, are serviceable in mild solutions. Finely triturated bismuth, calomel, lycopodium, oxide of zinc, and oleate of zinc, are valuable. The last-named drug is perhaps the best of all, if a good preparation be used. Merck's is unreliable, in my experience. Parke, Davis & Co., however, prepare a powdered oleate which is all that could be desired. The stearate of zinc is another elegant preparation.

Severe balanitis may require a dorsal incision of the prepuce to expose the parts for inspection and treatment.

Vegetations should be cut away with the scissors and their bases cauterized with fuming nitric acid. Cleanliness, dryness, and perhaps circumcision, are necessary to avoid their recurrence. The same principles of treatment are to govern here as in balanitis.

CHAPTER X.

TREATMENT OF GONORRHŒA IN THE FEMALE.

This differs in many respects from that of the corresponding disease in the male, owing to anatomical differences in the structures involved. In all acute processes of gonorrhœal inflammation in the female, the patient should be put to bed and kept perfectly quiet until the subsidence of the disease, which, under proper measures of treatment, usually requires less time than in the male, much depending upon the extent to which the pelvic organs are secondarily involved. A restricted diet, saline laxatives and hot sitz baths are usually required.

The best local measure of treatment consists in prolonged and frequent irrigations of the vagina with hot solutions of mercury bichloride, 1:10,000, or of saturated solutions of boric acid. Speedy removal of the products of virulent inflammation is the best measure of prophylaxis against extension of the inflammation to the uterus. The injections should be given by means of a fountain syringe and a small vaginal irrigator, each irrigation being continued for at least an hour. If there is very much pain, laudanum or morphia may be added to the solution. The injection should be repeated about every three hours. It is a good plan to give the last injection comparatively early in the evening and to follow it by packing the

vagina with dry impalpable powder of boracic acid. This drug is an antiseptic of moderate power, and, applied in this fashion, not only exercises its beneficial effects continuously for a considerable time, but reaches all of the interstices of the affected mucous membrane. If desired, a suppository of iodoform to which a little morphia has been added may be introduced at night. If the vaginitis tends to become chronic, the entire mucous membrane may be painted with a strong solution of nitrate of silver, forty to sixty grains to the ounce of water. The tincture of iodine—either applied pure or by irrigation in hot solution—is often of service in cases of this kind. Suppositories containing astringents, such as zinc sulphate, hydrastis, etc., are beneficial and easily used. Should the urethra be involved, copaiba or other balsams and alkaline diluents should be given internally. Urethritis is not apt to occur or become obstinate, because of the short, straight, and simple character of the canal. Vesical complications should be treated as in the male.

The glands of Bartholini are occasionally involved, the process usually terminating in suppuration. Should this occur, a free incision should be made, the cavity swabbed out with pure carbolic acid, plugged with pledgets of lint, smeared with carbolized vaselin, and thus compelled to heal from the bottom. It may be necessary to extirpate the gland before healing will occur. Personal observation leads me to

say that inflammation of these glands may be the only visible result of gonorrhœal infection.

The subacute and chronic inflammatory conditions which result from gonorrhœa in the female are more important and more frequently seen than the acute forms of inflammation. In order to discuss them thoroughly it would be necessary to encroach extensively upon the domain of gynæcology, so I will confine myself to those cases in which inflammation of the endometrium has directly followed gonorrhœal infection of a more or less recent date.

Sinclair* recommends intra-uterine injection of the pure tincture of iodine, this being followed by vaginal douches of a weak sublimate solution. He believes that by this treatment he prevents, in most cases, the extension of the disease to the Fallopian tubes. This operation must of necessity be very carefully performed, and I am free to say that I would hardly dare undertake it without a preliminary dilatation of the cervix. The introduction of iodoform tents into the uterine cavity, with the application of the pure tincture of iodine to the cervix, while perhaps not so thorough, has at least the advantage of being safe, and is consequently to be preferred. Preliminary dilatation is warrantable in cases of a very chronic character, but if there be any acuteness of the inflammatory process it is extremely dangerous and

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* *Op. cit.*

may produce the very pelvic complications which it is our desire to avoid. When once the process has involved the Fallopian tubes and pelvic peritoneum, ablation in the first instance and extirpation of all the affected parts in the second are all that can be depended upon for a cure. The responsibility of deciding upon the latter procedure rests entirely with the operative gynæcologist. It is questionable whether peritoneal involvement can be positively diagnosed in the majority of cases before operating, although, inferentially, sufficiently accurate opinions may be formed for practical purposes.

About the best routine prescription for application to the cervix in endometritis, particularly if the disease be of gonorrhœal origin, is the following:

℞ Iodini, gr. xx.
Potass. iodidi, ʒ ij.
Ac. carbol., gr. xx.
Ol. eucalyp., ʒ ij.
Mentholis, gr. xx.
Boro-glyceride, q. s. ad ℥ ij.

M. Sig.: To be applied by cotton-wrapped probe.

A solution of iodoform and ether, four drachms to the ounce, is also of service, and may be alternated with the foregoing prescription. A new preparation, composed of carbolic acid and camphor, known as "campho-phenique," is also a useful application. A solution of bichloride of mercury in compound tincture of benzoin, five grains to the ounce, is very useful.

Before making any of these applications, the secretions should be removed from the cervical endometrium; this is most readily accomplished by means of a cotton-tipped applicator soaked in a saturated solution of lead acetate or a strong solution of sodium bicarbonate, followed by irrigation with simple warm water.

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